..THE IRON AGE..

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PRODUCTION CANNOT FORGE AHEAD WITHOUT STABLE MONEY

By DR. WILLFORD I. KING

ECONOMIC historians tell us that, before credit transactions became important, business cycles, of the type now existing, were unknown. Perhaps, then, a study of the credit situation prevailing during the last few years may throw light on the cause of the current depression.

The fact has often been noted that high interest rates precede a collapse in business, and certain students of the business cycle have felt that the rising cost of loans causes the collapse. It seems probable that they have mistaken effect for cause. Interest rates rise during booms because many people wish to borrow and few are anxious to lend. It is doubtless true that high interest rates do play a part in causing the boom to end, but this part is probably a minor one. Much more important is the fact that booms tend to exhaust the credit resources both of individuals and of business concerns. Let us see how this comes about.

Optimism Leads to Excessive Borrowing

In normal times the average individual and the average enterprise each possess a certain credit margin. Some persons might be able to purchase on credit no more than a dollar's worth of commodities; others are "good for" millions. Any person or firm having a credit margin can temporarily spend more than his or its income. Once in three or four years, as a rule, a wave of optimism sweeps the nation. Then almost everyone has faith in some business venture. The typical man feels his future income to be reasonably secure. At such times, therefore, a widespread tendency exists to buy on credit. Radios, refrigerators, automobiles, houses, land, stocks, new factories, new equipment, new office buildings are purchased on the instalment plan. Such purchases mean that the buyers are temporarily spending more than their respective incomes—that they are gradually going deeper and deeper into debt.

Now, when almost everyone is spending more than his income, there is built up an abnormally strong demand for goods of all kinds. This abnormal demand, when it first appears, usually speeds up the production of goods, for previously-idle workers take their places on payrolls and high wages draw into industry men and women usually employed only around the home. Overtime work becomes common.

After this abnormally strong demand has persisted for a time, the sources of extra labor supply approach exhaustion. Therefore, the growing call for goods brings forth but few additional workers and but little increase in production, the effect of the intense demand now being confined mainly to raising prices.

At the crest of the boom, the total value of the industrial output of the nation is materially larger than the normal spending power of the nation, the excess representing additions to the net indebtedness of all the buyers of goods in the nation. Clearly this value of output cannot be maintained indefinitely, for, one by one, the buyers come to the ends of their respective credit margins. As they do this, demand perforce shrinks. As demand shrinks, production slackens and prices weaken.

Credit Buying Makes Price Collapse Inevitable

If this analysis is correct, it appears that, when a business boom is built upon credit buying, a price decline is inevitable, and a falling off

DR. WILLFORD I. KING

PROFESSOR of economics at New York University, member of the staff of the National Bureau of Economic Research and secretary of the American Statistical Association, the author is eminently qualified to discuss relation of our monetary system to the current depression. Born in Cascade, Iowa, June, 1880, Willford I. King received his college training at the University of Nebraska and the University of Wisconsin. After serving as instructor and later as assistant professor of political economy at the latter institution, he was from 1917 to 1920 statistician for the United States Public Health Service in field investigations of pellagra and from 1920 to 1927 economist with the National Bureau of Economic Research. Since 1927 he has been professor of economics at New York University.

in production almost certain to occur. The public would be best served if production were maintained nearly at peak level and the shrinkage were confined to prices alone. However, in practice, this is not what usually happens.

If, after a boom, only emergency and overtime labor were eliminated, and if the value shrinkage continued only to the point at which the total value of the industrial output was, say, 15 per cent less than the national income, the reaction might well be considered a healthy one. Such a value shrinkage would make it possible for the man who had been "borrowing to buy" to put about one-seventh of his income into paying off his debts, thus furnishing him with a new credit base to be used when need arose.

Unfortunately, however, recessions have a habit of forgetting to pause when this "healthy" shrinkage has been brought about. In far too many instances the decline, which has been proceeding in moderate and orderly fashion, suddenly develops into panic. Thereafter, every drop in price causes prospective buyers to postpone purchasing. Such postponements cause still further price declines, more factory shut-downs, more unemployment, smaller profits, less ability to buy. This cumulative process leads industry into the depths of depression.

Having considered causes of depression in the abstract, let us now apply these principles concretely to the present cycle. In 1928 and early 1929, extreme optimism was the rule. Business men, statesmen and even eminent economists assured us solemnly that we were in "a new era." We were told that better production and sales statistics, better banking control, better business organization, and a more conservative attitude on the part of business men made another severe depression extremely improbable. Earnings of the great corporations were slated to forge ahead indefinitely; hence stock prices, while admittedly high, were not likely to decline to any marked extent. Despite what has happened since, it is probably true that these optimistic prophets were nearly right in their appraisal of the industrial situation. It *was* essentially sound. However, one thing which they underestimated was the effect of unreasonable fear upon mass behavior. Another was the havoc which is wrought by a falling price level.

Overproduction Not a Basic Cause

Recently, many writers have been telling us that our present situation is the result of overproduction or of maladjustments in industry which can be corrected only by a severe depression. Both of these views appear to be largely fallacious. We may define overproduction as being the production of more of a given goods than the market will take at a price covering the expenses of producing it. Overproduction, thus defined, is easily detected, for, when it is present, stocks of the given goods steadily accumulate. In the early part of 1929, there was little evidence of such accumulation except in the case of a few raw materials. Consumers were taking most finished manufactured commodities as fast as they could be produced. There was, however, an element of danger in the situation, for, to a considerable extent, the demand was being kept up by increasing the volume of credit. Consumers, as a whole, were going more and more deeply into debt.

Apparently, however, the greatest strain on the credit of the buyers was not the purchase of automobiles, radios, or houses on the installment plan, but was rather the buying of securities on margin. During 1928 and 1929, billions of dollars worth of new securities were issued at inflated values. They would not have been absorbed so readily if the ultimate purchasers had been compelled to pay for them out of current income.

Apparently, it was during the latter part of 1928 or the early part of 1929 that exhaustion of credit on the part of the purchasers began to show its effect. Prices of commodities at wholesale eased off. Orders for finished products slackened. Prices of all but the most speculative securities weakened slightly. The total volume of orders for goods and securities was evidently contracting toward the total of the national income. It was not, however, until the autumn of 1929 that the public at large began to scent danger. Then stockholders everywhere attempted to turn their paper profits into cash. The result was the stock market crash of October and November of that year.

Business Was "Fundamentally Sound"

At the beginning of 1930, business men in chorus asserted that, while a collapse in inflated stock prices had been inevitable, business itself was fundamentally sound. Today there is no good reason for believing that they were not correct in their assertions. There had been no wild inflation of prices and little piling up of inventories. The more important business concerns had accumulated huge surpluses. Business was sound, but the same could not be said of public psychology.

As previously suggested, it was desirable that, for a time, the public, in general, should order goods having a total value less than the

national income, for only thus could the topheavy burden of indebtedness be reduced. A moderate lowering of prices was needed—but this process had already begun in 1928. Some shrinkage in the total volume of production was to be expected. This process of contraction had probably reached a logical stopping place at the time when President Hoover in an endeavor to restore confidence called his conferences of industrial leaders.

Confidence Shattered

Unfortunately, public confidence had been shaken more deeply than the President suspected. Optimism refused to be called up on order. The average man continued to use a considerable share of his income to pay off his debts, rather than to buy new goods. Few wished to borrow, and bankers feared to loan to those who did. Interest rates fell lower and lower. Savings bank deposits piled up. The demand for Government bonds continued strong, for confidence in the security of these issues remained unshaken.

The widespread desire to save and the general belief that prices would go still lower soon cut into the normal volume of orders to such an extent that men were laid off by wholesale. Shrinking profits made dividend reductions unavoidable. Wage cuts appeared here and there. All these forces lessened the possibility of buying goods. Thus matters progressed from bad to worse. And the end is not yet.

The fact should be noted that, only after the buying public had begun sharply to curtail its purchasing, did we hear much talk of overcapacity and overproduction. It seems clear then that these phenomena must be looked upon mainly as results of rather than as causes of the factors responsible for the business depression.

It may also be well to note that events as they have occurred appear to furnish very little support for the view that business depressions are remedies drastic but necessary for the cure of maladjustment and for the shaking out of the less efficient producers. There is no evidence whatever to indicate that maladjustment is less in extent today than it was in 1928. At present, many of the efficient as well as of the inefficient concerns are in danger of bankruptcy. Nearly every industry is suffering severe losses. Business depression as a remedy for business ills is on a par with the old custom of the physicians who bled their patients no matter what the ailment.

FINANCE has blamed industry for the depression, but the author, an eminent economist, declares that the shoe is on the other foot. Business cycles such as now exist were unknown before credit transactions became important in business.

¶ Nowhere has the pinching credit shoe of the present day halted production more than in the metal-working industry, always most severely affected by depressions. Readers of THE IRON AGE, therefore, have an immediate and primary interest in money as their most important "raw material."

¶ Our industry, and others as well, must think in terms of improved money control as well as in terms of improved production processes, believes Dr. King, who discusses the stabilization of our credit system as the first step toward the stabilization of business.

The patients who survived were doubtless strong, but many who perished would soon have recovered their strength had they not been bled.

Increase in Gold Value a Major Factor

Since the World War, American business has suffered four depressions; namely, those of 1921, 1924, 1927 and 1931. The first and the last of these have been characterized by great severity. The middle two were relatively mild. Why the difference?

While it is impossible in the present state of economic knowledge to give a positive answer to this question, certain facts stand out which probably have considerable significance. The 1921 depression was preceded by a wild boom in agriculture, manufacturing and trade. Just before the 1931 depression there was a great orgy of stock speculation. Most students of business cycles agree that depressions are the offspring of booms, and that, in general, the greater the boom the deeper the depression.

It appears also that both in 1921 and in 1931, another force may have played a great part in shoving industry into the depths. That force is the increase in the value of gold. In any country which, like ours, is on a gold standard, every change in the value of gold means a change in the purchasing power of all the money and of all the bank accounts in the nation. When the value of gold rises, we usually say, therefore, that there has been a fall in the general price level.

Now, both the depression of 1921 and 1931 were ushered in by sharp increases in the value of gold, in other words by a collapse in general prices. After 1921, the recovery in the price level was but slight. This fact proved that the price movement of 1920-1921 was largely a downward *trend* and not merely an effect of *cyclical* forces. The price decline of 1930-1931 has now gone so far that it scarcely seems probable that it will be offset by an equal rise in the price level during 1932-1933. The chances are, then, that once more the trend of prices is sharply downward.

Obstacles to Deflation

It is often contended that shifts in the price level are, after all, matters of but minor consequence. If cotton falls in price from 24c. a pound to 6c. and wheat at the same time drops from $1.20 to 30c. a bushel, what harm is done? The cotton farmer can, as of yore, still get a bushel of wheat for 5 lb. of cotton, and vice versa.

This argument ignores two facts fundamental in our economic life:

1. Prices do not all move together, many being fixed by law, contract or custom.
2. Fixed obligations remain the same no matter what the price level.

As an illustration of these facts, we may note that we pay for telephone, electric and railroad charges as much as we did in 1929. Far more important, employees everywhere are striving vigorously to maintain the same rates of pay in terms of dollars that they received during the boom. The man having a mortgage on his home or farm, the corporation having a mortgage on its property must

(*Continued on page* 1040)

THE MOTORIZATION OF MODERN GRINDERS

By J. W. HARPER
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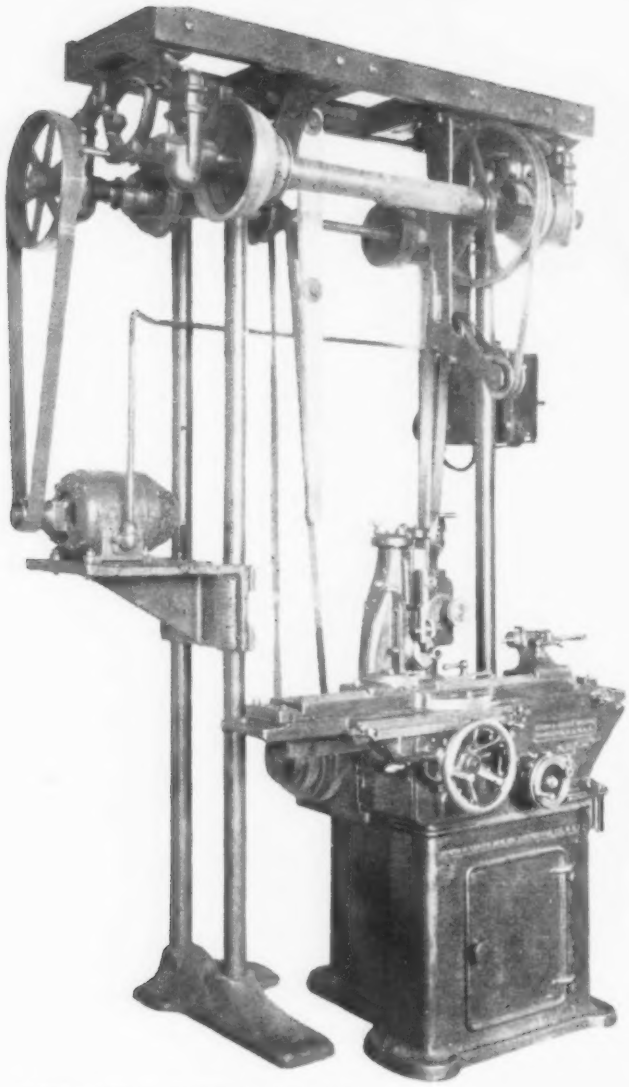


CONTRAST in appearance between early form of grinder and a modern motorized machine (opposite page) built by the same company ▲▲▲

AS a general rule the operating speed of grinding wheels should be in the neighborhood of 5,500 to 6,000 surface feet per minute. This speed may differ with the nature of the work, type of machine, etc. Shellac, bakelite and rubber-bonded wheels can be and are run at much higher speeds than vitrified or silicate-bonded wheels, and may go as high as 10,000 surface ft. per minute. The former wheels are usually termed "elastic" wheels because of the nature of the bond, which imparts a much higher tensile strength. It should be remembered that the force tending to burst a wheel increases as the square of the wheel speed. Hence a 20 per cent increase in speed causes a 40 per cent increase in centrifugal force. Care must therefore be observed to see that the safe speed of the wheel is not exceeded.

In line with the advance in abrasive manufacture in the past few years, the types of machines on which these wheels are to be used, have increased until there are almost as many kinds of machines as there are sizes and shapes of wheels. All such machines may be grouped into five general classifications:

1. For cylindrical and conical surfaces, internal or external, between centers or centerless.
2. For plane surfaces.
3. Cutter, tool and drill grinders.
4. Center and portable grinders.
5. Bench, floor and swing-frame grinders.

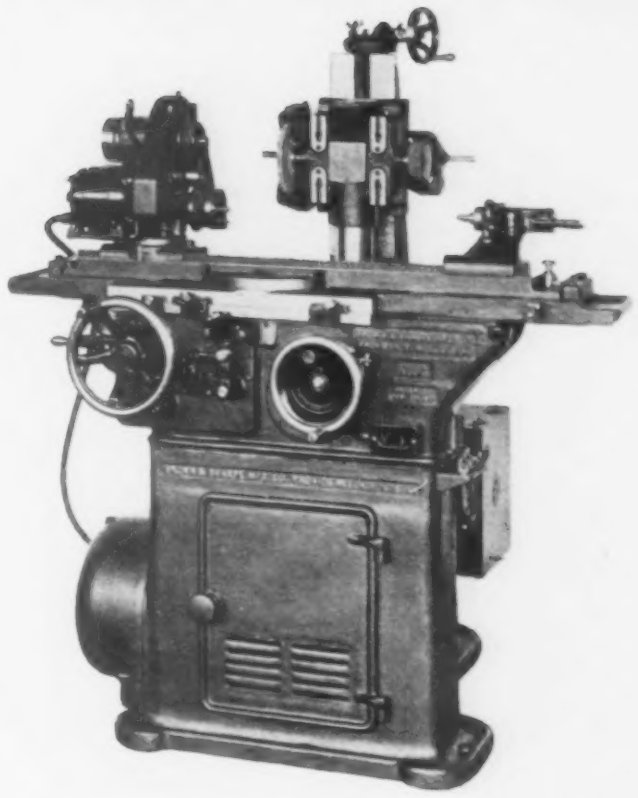
These classifications naturally are very rough but they do distinguish the general varieties. Under each heading, and particularly the first, many special forms could be listed. Many of these, however, are so very specialized in their application that they can be disregarded for our purposes.

Motorization of Light-Duty Grinders

As far as the motorization of groups (3) and (4) is concerned, standard motors are ordinarily used. As a rule such machines require motors of comparatively small output. In all cases of grinding machine motorization, it is desirable to protect the motor windings and bearings from abrasive dust, so that totally inclosed or fan-cooled motors are to be preferred, depending somewhat on the nearness of the motor to the grinding dust or sludge. Usually

THE grinding wheel is one of the oldest metal-working tools, antedating the lathe by many centuries. It is only since the advent of the automobile, however, that grinding has come into its own as a production method. Today, grinders, for production and other purposes, constitute one of the most widely used classes of equipment in the metal-working industry.

As the use of the grinder has grown, so also have the types of grinding mechanisms increased in variety. Today, there are almost as many varieties of grinders as there are sizes and shapes of grinding wheels. Inasmuch as proper grinding speeds have so much to do with successful operation, the question of motorization of the different types has become increasingly important. Thus the information in this article is of timely value to users as well as makers of grinders.



such machines use rather small wheels, and consequently a high speed is necessary. This, together with the small output required, keeps down the physical size of the motor. One manufacturer has taken advantage of this to use a drawn shell motor, purchasing only the stator and rotor, which he builds into a totally inclosing housing. Special large bearings are provided and the wheel is mounted directly on the motor shaft. In other cases standard motors, belted to the wheel spindles, are used. The built-in motor is also extensively used for portable grinders and where such grinders are made up for use in tool posts of planers, lathes, etc. Such a motor is admirably adapted to such applications, since by its use the overall size of the attachment can be kept to a minimum.

Bench and Floor-Type Machines

Bench and floor grinders cover those machines usually provided with two wheels having the driving motor between them. Several precautions should be observed in applying motors to such machines. The customary way of building such machines is to use merely the stator and rotor of the motor. The stator is supplied without openings, so that, with the solid end shields furnished by the builder, the motor becomes totally inclosed.

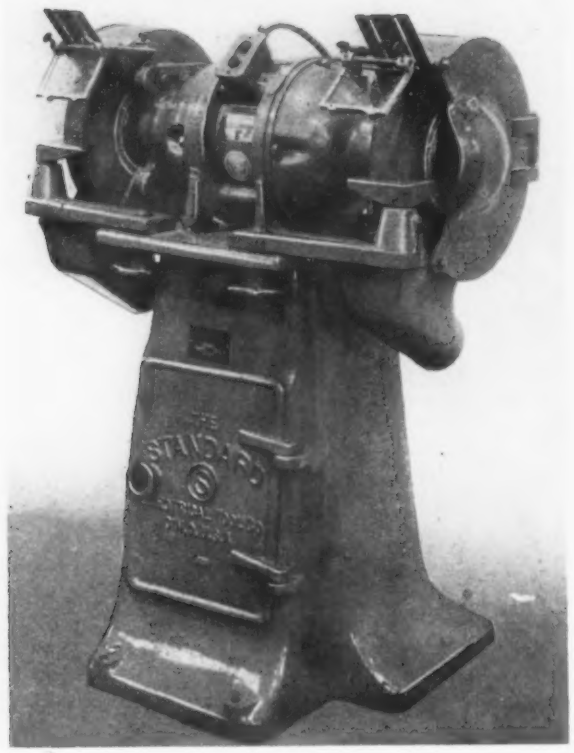
Such machines, and principally those of the floor stand type, are frequently used for rough grinding, with the work being held against the wheel either by hand or mechanically. Also, in order to be able to use the wheel most effectively, it should be located at some distance from the motor, necessitating a long shaft. These two requirements mean that a stiffer shaft than supplied with general purpose motors must be used for grinder applications. Because of the long, stiff shaft, and the radial load imposed by the work, large bearings are also required. For these various reasons it has been found that the machine builder should logically furnish the end shields, bearings and shafts for motors used on such grinders.

Time Ratings of Grinder Motors

Since such machines are used only part of the time, the motors used are rated on either a 30-min. or 1-hr. basis, with the requirement that they be capable of running light continuously. Such a rating is merely a convenient means of designating the motor capacity. Ordinarily one would not expect the machine to be used 30 min. and then rest for an indeterminate period. The actual conditions are likely to be that it would be used a few minutes and then rest and repeat. If such a machine is used with an automatic feed rather than hand, it is quite possible that a motor of longer time rating may be necessary, because of the possible higher percentage of "time on."

It sometimes becomes desirable to make homemade grinders for various purposes. Frequently it will be found that a much less expensive proposition can be obtained from a manufacturer of such equipment.

For reasons mentioned above, it is not generally feasible to mount the wheel directly on the motor shaft. It is preferable to mount the wheel in its own bearings and direct connect the motor. This applies particularly to heavy work. If tool grinding or other light work is to be done, the wheel may, in certain cases, be mounted on the motor shaft. Even in such cases care should be taken to exclude grinding dust from the motor windings. Grinder manufacturers also provide some sort of labyrinth seal on their bearings to protect these parts from the abrasive dust, which would soon ruin any bearing if it gained entrance. The totally inclosed fan-cooled motor, now extensively used in dirty applications, is quite suit-



Double-spindle grinder built around the motor stator and rotor. Control is mounted in the machine base.

able for grinder service, but even it should be provided with labyrinth bearing seals.

Swing-frame grinder motors are subjected to unusually severe service conditions. These motors are usually mounted at one end of a pivoted or suspended arm with the grinding wheel at the other, with belts or other drive mechanism between. Ball-bearing motors should be used since the motor has to move in all directions. Fan-cooled motors are essential since these machines are most often used in foundries where they are subject to all the foundry dust as well as the grinding dust in the immediate vicinity. In most cases this grinding dust is thrown directly at the motor, so that added protection in the shape of a sheet metal guard between the wheel and the motor is often desirable to prevent this dust striking the motor directly. Labyrinth bearing seals are also good insurance against trouble.

Grinders for Plane Surfaces

Grinders for plane surfaces take numerous forms. Probably the most common is the small surface grinder with horizontal wheel spindle and reciprocating table. The motor for these machines is usually mounted in the base and drives the wheel spindle through a system of belts. In one case, at least, the motor has been built on to the wheel spindle, making use of drawn shell motor parts as outlined previously. Such an arrangement simplifies the mechanical layout tremendously and should find wider application. The built-in mounting should, of course, be totally inclosed or inclosed fan-cooled, while the belted drive would make use of a perfectly standard motor mounted in the base.

Surface grinders of the Blanchard type with vertical spindle have the motor mounted on the spindle in practically all cases. Since wet grinding is the rule on such machines, troubles from grinding dust are not so likely to occur. Open motors are used, but protection from splashing is provided. These motors are larger than for cutter, or small surface grinders, so that standard motor parts rather than drawn shell motors are used. Auxiliary motors for driving coolant and oil pumps are mounted away from contact with grinding dust, so that standard motors can be used.

Disk Grinder Drives

Disk grinders are similar to the floor machines previously discussed. Here the work is passed across the vertical face of an abrasive disk mounted on the motor shaft. The same general precautions as regards the motor arrangement as were given for floor grinders apply here. In fact, the machines are much the same except for the type of wheel used, and its mounting.

Face grinders are extensively used for grinding off large flat surfaces on castings, or knives, guide bars, etc. In such machines the wheel spindle is horizontal; a cylinder wheel, either solid or segmental, is used, and the work is passed across the face of the wheel on a reciprocating table. The wheels used are large and hence run at slow speed and require considerable horsepower. It is therefore simpler to use a higher speed motor and drive the wheel spindle through chains or gears. This puts the wheel in its own bearings, so that the spindle can be made amply large for the load. Separate motors are used for coolant pump and table traverse on the latest models of such machines.

Because of the size of the machine and character of the work, there is not much danger to the motors from grinding dust. Wet grinding is done, with the

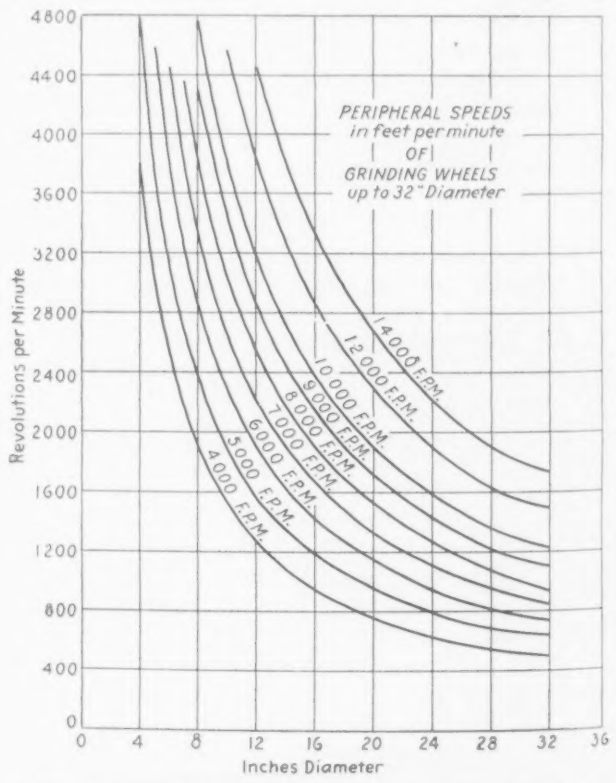


Chart showing relation of wheel speed to peripheral speed for grinding wheels of various sizes.

wheel well guarded to confine the coolant and prevent its splashing. Consequently, standard open motors are usually satisfactory. If excessive moisture is present an additional coat of insulating varnish on the motor windings would be advisable. Additional protection could be obtained by using fan-cooled motors for especially severe conditions.

External and Internal Cylindrical Grinders

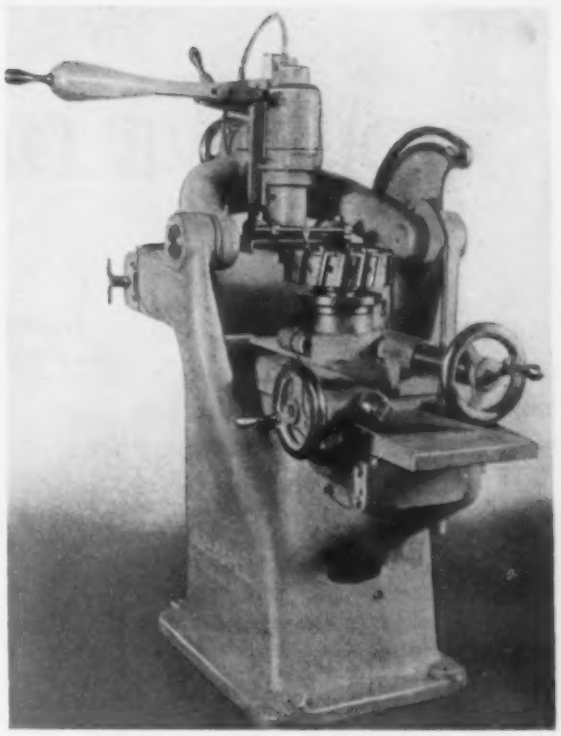
Cylindrical grinders, strictly speaking, should include all machines which grind a cylindrical surface, whether internal or external. However, in general practice they are assumed to refer only to external machines. Internal grinders are almost in a class by themselves, due principally to the fact that they ordinarily employ very small wheels running at very high speeds. It has been customary to use a 3600-r.p.m. motor belted to the wheel spindle to bring the speed up to the proper value. In order to eliminate belt troubles under these conditions, a large number of applications of high-frequency drawn shell motors have been made. Motors operating at 420 cycles—25,200 r.p.m. synchronous—have been successfully operated for a number of years driving very small wheels for grinding ball races. Motors for operating at various frequencies above 60 cycles are readily available. Here again, stator and rotor only are furnished by the motor builder, the housing, bearings and shaft being supplied by the machine builder. Such construction permits of a very simple, rigid head, with little slippage.

High Frequencies for High Speeds

The use of such high frequencies means that some source of high-frequency current must be available. Suitable frequency converters can be had which will supply such power. They are particularly suited to taking care of a battery of grinders where the load factor of the group can be considered in selecting the converter size. Where only one or two machines are installed the converter must be sufficiently large to be sure that the motors will start, as well as run. In larger groups the converter is inherently large enough to insure starting.

Cylindrical grinders for external work may assume a large variety of forms, depending on the work to be done, such as plain and universal grinders, cam and crankshaft grinders, roll grinders, etc. These machines usually have a bed, the length of which may vary, on which the work is supported between centers. The grinding wheel and its mechanism are located back of the bed and means are provided for traversing the work past the wheel. Such machines in the larger sizes required for grinding steel mill and paper mill rolls may have as many as seven motors of varying sizes.

In the ordinary grinder for shaft work the wheel is driven from a standard motor mounted on the rear of the base. An adjustable-speed direct-current motor on the headstock is arranged to rotate the work between the centers. The use of this adjustable-speed motor is such an



Cutter grinder with a built-in motor on the wheel spindle.

aid in maintaining the proper relationship between the work speed and wheel speed that generators for supplying direct current are included in the standard equipment of machines to be used where only alternating current is available.

Modernization of Grinder Mechanisms

Motorization has changed the appearance of such grinders, probably more than any others. A photograph of an old belt-driven machine shows an elaborate framework supporting various shafts, pulleys and belts. Particularly noticeable is one very long pulley, required to take care of the traverse of the work table. In the new machine this becomes merely a small motor and speed reducer mounted on the table and used to rotate the work.

Probably the modern large roll grinder is the most elaborate as far as the motor drive is concerned. Each of the various functions has its own individual motor. In order to take care of a long roll, the carriage on which the wheel is mounted is arranged to traverse along the work instead of having the table carrying the work pass in front of the wheel as in the smaller sizes. In addition to the main wheel drive and work-rotating motors, we then have a third for traversing the wheel carriage. Due to the large size a motor is also used for moving the wheel toward and away from the work. The list of motors necessary is completed with those for the various coolant and oil pumps, each of which has its own motor. No special features are required on these motors, except that semi-inclosing covers are desirable to prevent the operator

(*Concluded on page* 1021)

IDLE WELDING FACILITIES PUT

By SAMUEL MARTIN, JR.
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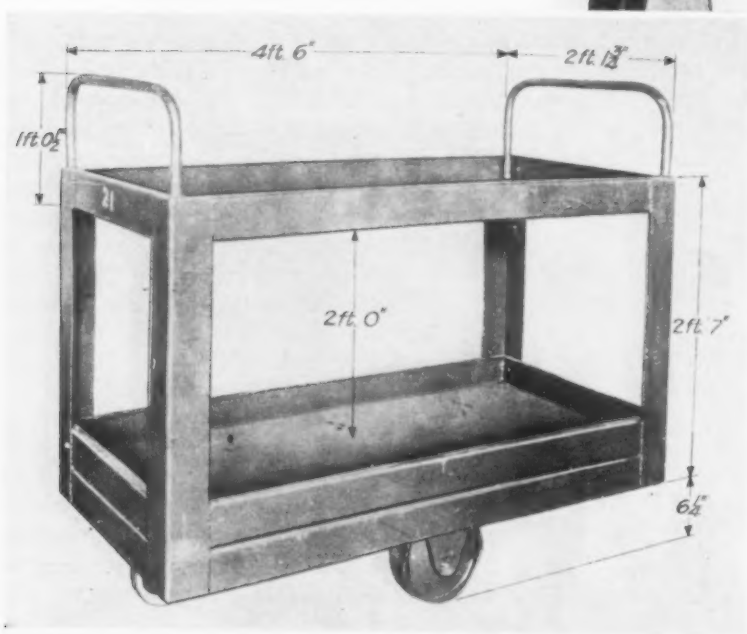
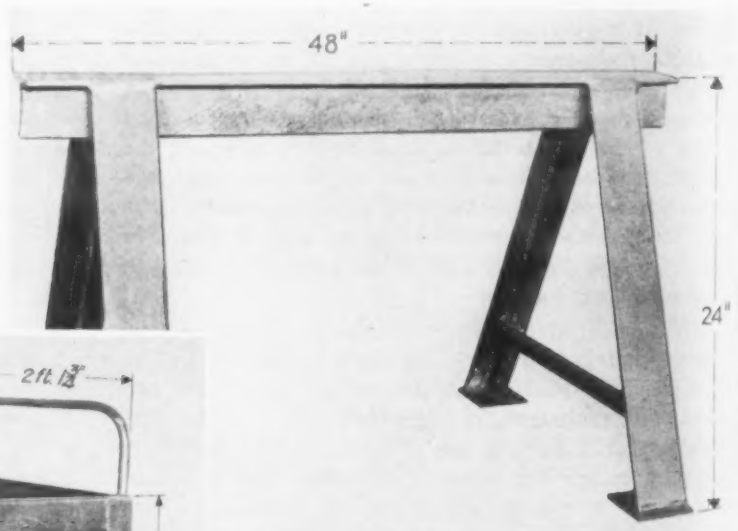
ARC welding, as a tool, has grown to be indispensable in the manufacture of various steel shapes. In many plants it has reduced manufacturing costs by the elimination of intricate patterns that are expensive both to make and to store. It also has reduced overhead by avoiding the use of large machine tools required for finishing castings and by releasing for manufacturing purposes floor space formerly required for pattern storage. Then, in the case of very large equipment, the lighter weight of the welded steel construction facilitates shipment.

In manufacturing large pieces of apparatus, it is necessary, of course, to have the proper welding equipment. For a large shop with a great many operators, a constant-potential arc welding set often proves most economical. The percentage of operating time of each individual welder takes care of equalizing the load on the constant-potential sets. In the smaller shop, a single-operator arc welding set usually is most satisfactory.

There are always times in a welding shop when the equipment and welder are not busy. Such periods occur when production is low and when pieces of equipment are being set up and prepared for welding. An idle tool increases the overhead and idle labor increases cost. The idle arc welding set should be put to work, if not on production for reasons outlined

HAND trucks (below) specially designed to meet the needs of other departments can be made in the welding shop.





A SERVICEABLE horse welded from odd lengths of structural steel. (Above.)

TO WORK ON SHOP JOBS

WHEN production slackens or when work is being set up and prepared for welding, the added cost occasioned by idle labor and equipment may be largely eliminated by fabricating needed shop devices, such as welded steel gear guards, ladders, steel horses, platform trucks and the other pieces of equipment illustrated in this article.

above, on odd jobs which will be beneficial to production. What can be done with an idle welding circuit that will improve such conditions?

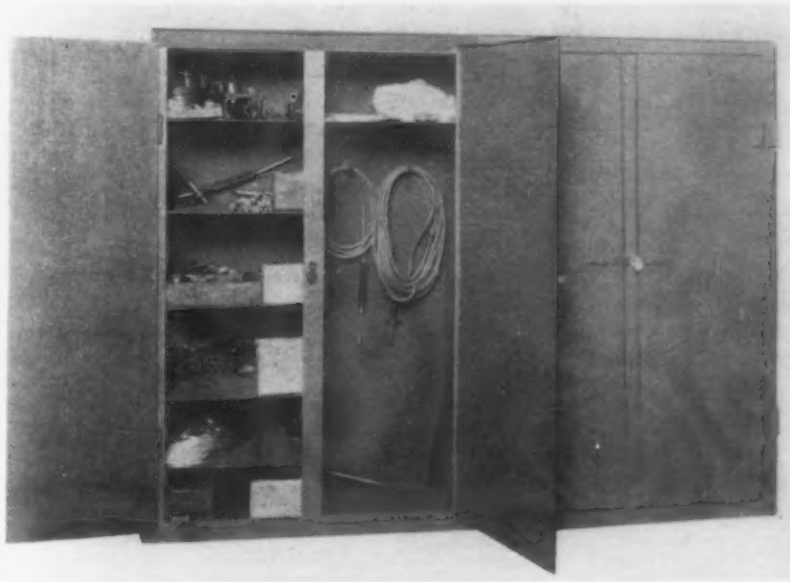
Many Safety Devices Can Be Made in the Welding Shop

Quite often in times of peak production, safety devices are overlooked. Also inadequate and unsafe equipment is used to meet production schedules. The welder can readily make the necessary protective device or the new equipment that has been needed for a long time. The accompanying illustrations may give some suggestions along this line.

The ladder is an excellent example of a piece of shop equipment that can be fabricated as suggested, the particular ladder illustrated having been fabricated from steel pipe by welding. The ends of the pipe making the rungs have been cut to the curvature of the uprights and then welded into place. No special preparation of joints was required prior to making the fillet weld for joining these parts other than the usual scratch brush cleaning. A ladder made this way is strong, rigid and safe. It eliminates the possibility of an accident caused by a broken rung or weak upright.

A steel horse is another example of shop equipment which could be readily made by a welder in a short time. The one illustrated was fabricated from five T-bars, two angle bars and four small pieces of steel, all of which might otherwise have been scrapped and wasted. The legs of the horse have part of the flange cut from the "T" so that they fit readily to the cross member. A few fillet welds complete the work and the finished product is ready for shop use. Like the ladder, it is sturdy, strong and reliable.

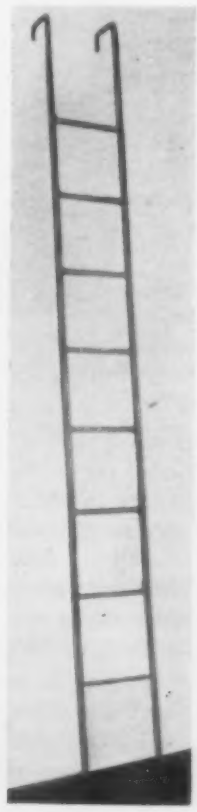
A platform truck can be fabricated readily from channels and plate sections. When welded together, it will stand the abuse to which such equipment is subjected. Similar pieces of shop equipment include



NEAT and strong, this steel shop ladder was fabricated by arc welding. (At right.)

* * *

TOOL lockers are a convenience that the welder can provide for himself. (At left.)



all-welded hand trucks and all-welded skids. The latter are very simple to make, requiring only four formed pieces of steel and a sheet plate each. There are no holes drilled or punched, no rivets or bolts, and no protruding parts to break the surface of the skid. It is as solid as if formed from one piece.

In addition to making numerous odd pieces of shop equipment which aid in the normal production of the shop, the welder can manufacture various protective devices. Illustrated is an all-arc-welded housing to cover a set of gears. This is extremely simple to make, requiring two pieces of sheet steel and a few flanges to fasten it in place. Similar shields could be very readily manufactured for the covering of a chain or belt or other moving part. Such protective devices not only pay for themselves, but pay for the arc welding set which made them, in preventing an accident which might even cost a life.

It may be that the welder himself needs a shield about his work to protect the other shop men from the ultra-violet rays of the arc. Recently a large welding shop made several portable screens for the protection of individuals visiting the welding shop while the welder was at work. Steel plates, a few angles, hinges and channels are all that is required. The welder does the rest. If the screen is so large that it needs a crane to move it, a small eye bolt can be welded to it, or a couple of holes can be cut in the outside plate to serve the same purpose.

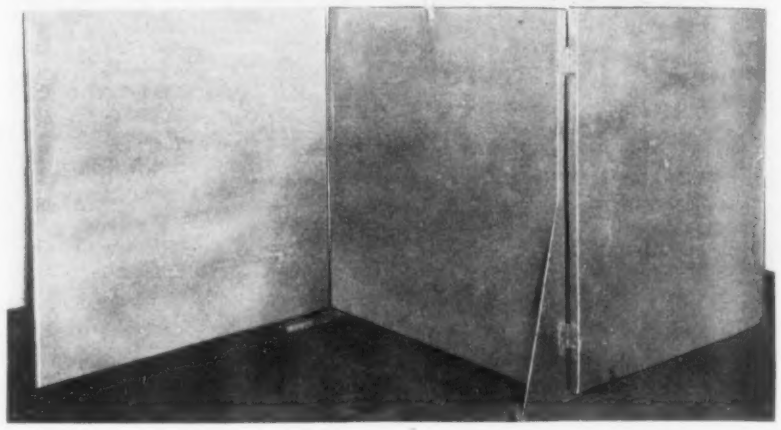
An arc welding set can and should be in constant use, if not on production work, to improve working conditions. If all of the welding circuits of the shop are busy 100 per cent of the time, the manufacture of improved shop equipment and safety devices alone might warrant the addition of another welding circuit, giving employment to another welder.

▲ ▲ ▲

VISITORS to the welding shop are grateful for the eye protection afforded by simple welded screens.

* * *

GEAR housings are important safety devices; they can easily be made by welding.



Marked Progress of Electric Arc Melting Furnaces in 20 Years

IN the period of two decades, or 20 years, the electric arc furnace for melting has made wonderful progress, said W. E. Moore, metallurgical engineer, Pittsburgh Electric Furnace Corpn., Pittsburgh, in a paper before the sixtieth general meeting of the Electrochemical Society at Salt Lake City, Utah, Sept. 2 to 5.

Such furnaces have increased in number 65 times, in maximum size per heat five times, in maximum daily capacity 10 times, while the power consumption per unit ton output has been decreased from 600 to 800 down to 400 to 600 kwhr., said Mr. Moore. The carbon electrode consumption has decreased from 30 to 40 lb. (14 to 18 kg.) down to 8 to 15 lb. (3.6 to 6.8 kg.). The total conversion cost on the output has been correspondingly lowered by reason of these improvements and by the more rapid type of operation and the lower maintenance, refractory and slag costs.

It is predicted by Mr. Moore that within the next two decades the modern rapid-type electric furnace will have displaced a large percentage of open-hearth capacity, both in the commercial steel mills of this country and in the foundries. In addition to this, the electric furnace will undoubtedly displace a large part of the cupola gray iron capacity for iron foundries and of the air furnace melting capacity in malleable iron and chilled iron foundries.

How a Jobbing Plant Keeps Accurate Costs on All Work

By W. S. MOSHER
President, Mosher Steel & Machinery Co.,
Dallas, Tex.

KEEPING accurate costs on straight line production of repetitive work is one thing, but it is quite another to know costs and keep them accurately in a jobbing manufacturing plant where every piece of work differs somewhat from the others. The Mosher Steel & Machinery Co., Dallas, and Houston, Tex., has had a cost system functioning for thirty years, and it has been changed to keep pace with the times. The company operates machine shops, fabricating shops for structural steel, plates and concrete bars, a foundry, an ornamental iron shop and does erecting work, all of which requires an exact system, which Mr. Mosher, president, explains in this article.

AN expert cost accountant recently made the statement that 5 per cent of cost systems were functioning, 5 per cent were passable and 90 per cent were "pure bunk." This I cannot verify because I am a manufacturer and not an accountant. However, this statement might be partially accounted for in that cost systems do not serve the intended purpose unless adjusted to the particular business or industry to which they are applied, and will not function unless an executive officer gives his active interest and supervision to their installation and maintenance.

A cost system adequate for straight-line manufacturing of a standard line of products would not be suitable for jobbing manufacturing where the product is changed frequently. This is especially true in structural steel fabricating, to which this article particularly applies.

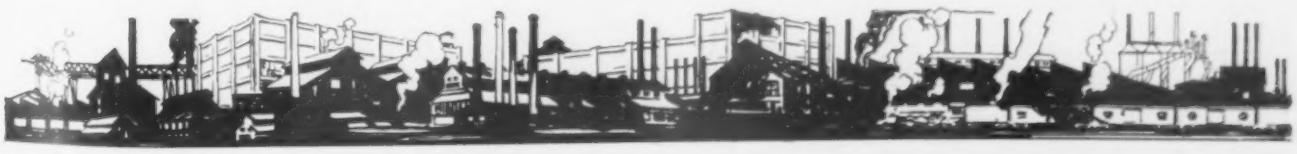
Advantages of a Cost System

A manufacturer who does not have a properly functioning cost system has no accurate basis for the sale of his product at a profit, and necessarily must establish his selling price by guess instead of by accurate estimates, or by trying to outguess his competitor whose knowledge of costs may be more misleading than his own.

It is also true that costs on products in plants may vary greatly in the same section or city. One manufacturer may be well equipped for certain classes of products in his line and have very reasonable costs, and on others be very poorly equipped to handle and have very high costs. A proper cost system reveals these weaknesses and indicates the most desirable work to be solicited, so that the plant will be fabricating products that can be produced at costs that will yield the greatest profits.

As an example of this: A superintendent of a structural steel plant made the statement to the president of the company that money was being lost on a certain product, to which the president replied: "We are getting the same price we have always received." The superintendent submitted data to the president proving that the sale price had always been below cost of material, labor and a proper absorption of burden, and the result was that the selling price was advanced and the buyer accepted the increased price, as he had previously been the beneficiary of "prices below cost." The incident resulted in the installation by this fabricator of a cost system that yielded larger profits than ever before.

It is claimed by those who are in a position to make an analysis of the structural steel industry



that the profit of the average fabricator in normal times does not exceed $5 out of each $100 business executed. The various elements in each $100 of business would be approximately as follows:

Material	$56.50
Productive labor	16.00
Burden or overhead—including everything in departmental burden, selling and administrative expense, usually considered reasonable at 125 per cent of productive labor	20.00
Income tax, bad debts, donations and other contingencies	2.50
Profit	5.00
Total	$100.00

The above distribution will vary with different fabricators according to class of product and competition. The most variable factor is that of profit, which may vary downward to the vanishing point, or a red figure, if any of the other factors should be allowed to exceed their proper proportion.

Material should be the least difficult to estimate. Productive (or direct) labor can be estimated only from past history of jobs executed and from accurate recorded data.

The term "burden" is a more expressive term than "overhead," which is a misnomer. This will be commented on particularly in reference to Fig. 2.

The cost system illustrated here by exhibits is used by Mosher Steel & Machinery Co., Dallas, Tex., which operates the Houston Structural Steel Co., Houston, Tex., and a small plant at Tyler, Tex. This company operates machine shops and a foundry; structural steel, concrete bar and plate fabricating departments, an ornamental iron workshop, and erection departments which erect considerable of its products.

The first cost system was installed about 30 years ago when the company was operating a small plant and it has been altered and improved regularly to fit current conditions. In January, 1930, a revised system was installed which coordinated selling, estimating, operating and accounting departments.

Fig. 1 is an example of the original order entered by the sales department. The information under estimated cost in Fig. 1 is for the accounting department. This is summarized from the detailed estimate prepared by the estimating department from compiled data of costs on previous jobs executed and classified as to various departments.

Fig. 2 is furnished to the estimating department the first of each year and is prepared from data compiled from several years' experiences by the accounting department. These percentages are arbitrary and will vary according to each business and will be dependent entirely on what the practice of the management is in making distribution of general expenses. Some firms prefer to debit plant administration, purchasing, etc., to plant operating depart-

Fig. 1—Original Order and Distribution of Departmental Credit

(In dollars, except for weights)

Customer—John Doe	Bill of Lading to—John Doe
Address—Fort Worth, Tex. Our Order No., 90010	Invoice to—John Doe
Ship to above Customer Order No., 1461	Approval to—A. B. Seay, architect, First National Bank Building,
Destination—Ship to above Ordered by—J. Smith	Fort Worth, Tex.
Delivery promised—10/31/'31 Freight Charges Prepaid	Credit Order to—M. M. S. North.
Terms—Regular	Estimate No. 863.
Project—Smith Building. Order entered by—MMS. Date 8/1/'31	Net Price—$45,545.00.

Quantity	Description	Dept. and Prod. class	Estimated weight	Estimated Cost: Material	Labor	Burden	Estimated profit	Sale price
	Structural plate and ornamental steel for Smith building, as per plans and specifications by A. B. Seay, architect:							
	Structural	32	800,000	20,000.00	3,200.00	3,000.00	1,310.00	27,510.00
	Plate	33	100,000	2,500.00	1,000.00	850.00	261.00	4,611.00
	Ornamental steel or (iron)	34	60,000	2,500.00	1,500.00	875.00	341.25	5,216.25
	Engineering	18	0	0	1,500.00	600.00	0	2,100.00
	Totals		960,000	25,000.00	7,200.00	5,325.00	1,912.25	39,437.25
	Freight							1,980.00
	Commercial expense							4,127.75
								45,545.00

Record of Billing			
	Invoice: Date	Number	Amount
Est. No. 1	8/31/'31	10965	20,000.00
Est. No. 2	9/30/'31	11422	20,000.00
Final	10/31/'31	11838	5,545.00
			45,545.00

Fig. 3—Job Cost Sheet—Plant

(In dollars, except for weights)

Date started, 8/10/'31. Date Completed, 10/28/'31. Customer, John Doe. Job, No. 90010.

Structural Department							Engineering Department			Transportation Out	
Material			Direct Labor	Dept. Burden	Direct Expense	Explanation	Direct Labor	Dept. Burden	Direct Expense	Explanation	Amount
Weight	Amount	Burden									
Estimated Cost											
800,000	20,000	600	3,200	2,400	.....	.....	1,500	630	.....	Freight	1,980
Actual Cost The actual costs are posted in detail as the job progresses and the cumulative costs to date are compared with the estimated costs above.											
801,050	20,026.25	600.79	3,110.00	2,332.50	.....	.....	1,640.00	656.00	.....	.....	1,977.50

ments and this would correspondingly affect the percentage of commercial burden. The absorption of burden in an accurate way is one of the most important factors in cost accounting.

This article assumes that the burden is about 125 per cent of productive labor in an average fabricating plant. Small shops would probably be more, large shops less. This percentage is not constant on all jobs. On jobs where there is a small amount of labor and a large amount of material, the per cent of burden to productive labor will be more than 125 per cent because of the amount of burden absorbed by material. This is illustrated in Fig. 1, which shows the percentage of total burden to productive labor over 125 per cent. On the other hand, when a job has a large amount of labor and a small amount of material, the percentage of total burden to productive labor would be less than 125.

Many cost systems absorb all of the burden, including commercial expense, at fixed percentages of productive labor and absorb none of the burden on the basis of the material used. The costs arrived at by such a system are erroneous because on jobs having a small amount of labor and large amount of material the costs are lower than they should be, and on jobs having a large amount of labor and a small amount of material costs are higher than they should be.

The ideal system of distribution and absorption of burden is for material to absorb its proper proportion of burden and for each machine to absorb its proper proportion based on an hourly rate and for labor to absorb its proper proportion on a percentage or hourly basis.

Some advocate that there should be absorbed in cost an amount for interest on capital investment.

Fig. 2

Burden Per Cent

The estimating department will compute burden on cost of direct productive labor to cover department expense using the following:

Department	Percentage of Direct Productive Labor
Structural	75%
Plate	75%
Ornamental	50%
Engineering	40%

Commercial Expense

The estimating department will estimate the total amount to be included in the cost of job to cover selling, general, and administrative expenses on the basis of 11 per cent of manufacturing cost.

Material-Handling Burden

The burden of the receiving, warehouse and shipping departments will be applied to jobs at the following percentage of value of material charged to production orders:

On Materials Issued from Stock	Percentage of Value
Ornamental Shop Stock	5%
Plate Shop Stock	4%
Structural Steel Stock	3%
Warehouse Stock	5%

Fig. 4—Job Cost Sheet—Plant

(In dollars, except for weights)

Date Started, 8/10/'31. Date Completed, 10/28/'31. Customer, John Doe. Job No. 90010.

Plate Department					Ornamental Department						
Material			Direct Labor	Dept. Burden	Material			Direct Labor	Dept. Burden	Total Cost	Commercial Expense
Weight	Amount	Burden			Weight	Amount	Burden				
Estimated Cost											
100,000	2,500.00	100.00	1,000.00	750.00	60,000	2,500.00	125.00	1,500.00	750.00	39,505.00	4,127.75
Actual Cost The actual costs are posted in detail as the job progresses and the cumulative costs to date are compared with the estimated costs above.											
99,000	2,475.00	99.00	995.00	746.25	61,200	2,250.00	127.50	1,485.00	742.50	39,563.29	4,127.75

The position is taken that capital could be invested with a 5 or 6 per cent return and that a similar amount should be included in cost, and an amount set up in reserves to cover. This is debatable and this system makes no provision for it on the theory that it does not do justice to selling and operating departments.

Some systems do not absorb in their cost anything for interest paid on borrowed money, bonds, etc., claiming that is capital responsibility and that no part should be included in cost. There are others who claim that depreciation should not be included in cost. Fig. 2 includes in burden any interest paid, depreciation, and, in fact, all costs and expenses of the business other than material and productive labor. Of course, each concern may have expenses which do not pertain to its regular business which would not be included in burden.

Material handling burden includes all expenses of the receiving, warehouse and shipping departments for handling stock material before fabrication is begun and after fabrication is completed, which includes warehouse building repairs, depreciation, etc. The cost of labor for unloading material from cars and distributing in the warehouse or stock material stacks is added to the cost of stock material.

The exhibits do not show the system used in the machine shop and certain departments where each machine is rated at a certain amount per hour. The rate per hour is arrived at by dividing burden for the year by the total number of hours the machine operates. For a machine unit which cost $10,000 installed and averaged only 5 hr. operation daily, the burden cost per hour would be about $2.40. This amount will cover depreciation, maintenance, power to drive it, and floor rent for space occupied. If interest on the investment is included, it would require from 35 to 40 per cent of the cost of each machine installed to be absorbed before the machine actually begins to earn on its investment cost.

Fig. 5

(In dollars)

Analysis—Sales and Cost of Sales. Customer—John Doe. Job. No. 90010.

Accounts	Sale Distribution	Actual cost	Gross profit amount	Estimated cost	Estimated cost under actual	Estimated cost over actual
Structural sales material	21,000.00	20,026.25	973.75	20,000.00	26.25	.....
Labor and burden	6,510.00	6,043.29	466.71	6,200.00	.....	156.71
Plate sales material	2,650.00	2,475.00	175.00	2,500.00	.....	25.00
Labor and burden	1,961.00	1,840.25	120.75	1,850.00	.....	9.75
Ornamental sales material	2,675.00	2,550.00	125.00	2,500.00	50.00	.....
Labor and burden	2,541.25	2,355.00	186.25	2,375.00	.....	20.00
Engineering labor and burden	2,100.00	2,296.00	*196.00	2,100.00	196.00	.....
Outbound transportation	1,980.00	1,977.50	2.50	1,980.00	.....	2.50
					272.25	213.96
Commercial expense	4,127.75	4,127.75	.....	4,127.75	.....	.....
Total	45,545.00	43,691.04	1,853.96	43,632.75	58.29	.....

*Italic face used to represent red ink figures.

Features of the Mosher System

Department burden includes monthly taxes, insurance, repairs, supervision, electric power, etc. Plant inspectors and any labor actually handling material are considered productive. The engineering and trucking departments are considered semi-productive; that is, while they are treated as productive departments no profit is estimated on their cost.

Under commercial expense there is included executive, accounting, purchasing, plant officials, order department, sales department, credit department; in fact, all miscellaneous expenses generally called "general expense."

After the cost of manufacturing is secured in the cost summary for the manufacturing department, a proper percentage, based on the figures shown by the experience of the business, should be added to the manufacturing cost to absorb commercial burden.

The burden of each machine is recorded by means of a system of standing orders for maintenance on the machines, and, when the burden becomes so high that it is out of proportion to the value of the machine, it should be replaced by another machine.

The timekeeping clerk, who records the men's time, also reports the actual number of hours daily that each machine is operated, and a recapitulation of the actual hours the machines are used is given to the officers monthly.

Cost Sheet Kept on Each Job

Figs. 3 and 4 represent both sides of a job cost sheet, and constitute the itemized record of all costs on any particular job. Upon receipt by the cost ac-

countant of a copy of the order, Fig. 1, the job cost sheet is opened by filling in the customer's name, job number and all estimated costs under appropriate headings for the departments affected. Actual costs are posted to the job cost sheet daily from time cards, material slips, invoices, and all other posting media. This permits a comparison at any time of the actual cumulative cost to date with the estimated cost. Upon completion of a job, the total costs, as reflected by the job cost sheet, are summarized by departments and transferred to the column headed "actual cost" on the reverse side of the order, shown as Fig. 5.

At the end of each month the aggregate of the total costs to date of all jobs which have not been completed represents the inventory of work in process, and the detailed costs are kept in agreement with a general ledger control of work in process.

In comparing Fig. 5 with Fig. 1, it will be noted that the department credits allocated on Fig. 1 are carried to Fig. 5. After costs are completed and assembled, as shown by Fig. 3 and 4, this summary sheet is completed. The amount originally allocated by the estimating department is credited to each department so that the profit a department makes will show more or less according to how accurately the cost of the department was estimated by the estimating department.

Weekly reports are made to the officials and department heads showing how nearly the productive labor cost in each department on jobs in process or completed during the week compares with that estimated by the estimating department, and variations are shown in black and red figures. A recapitulation is made monthly, quarterly and annually comparing the total cost of all completed jobs with the estimated cost and showing the profit or loss on the jobs and also the variations from the original estimates in black and red figures. These reports are analyzed by the proper officials and investigation is made when there are variations of consequence to discover the cause and determine whether the weakness is in operating or estimating.

Perpetual Inventory Is Kept

A perpetual inventory account is kept of each class of stock. The cost of each class of any material taken out of stock each month is credited to proper inventory account and included in the cost of orders in process during the current month. The aggregate of each class of material received each month is debited to the proper stock account. The perpetual inventory of each class of stock is kept for weight as well as for value and should compare closely with physical inventories when taken.

Fig. 7—Annual Proof of All Costs

(In dollars)

Department	Material	Productive labor	Actual burden	Burden absorbed	Burden under*, Over absorbed
Structural	432,388.85	159,448.65	132,000.00	132,558.15	558.15
Plate	136,252.50	50,650.00	43,200.00	43,437.60	237.60
Ornamental	62,160.00	30,000.00	18,000.00	18,108.00	108.00
Engineering	.....	14,100.00	5,550.00	5,640.00	90.00
Total	630,801.35	254,198.65	198,750.00	199,743.75	993.75
Commercial expense	.....	.....	116,250.00	116,831.25	581.25
Total			315,000.00	316,575.00	1,575.00
Productive labor			254,198.65	254,198.65	.....
Material			630,801.35	630,801.35	.....
Total			1,200,000.00	1,201,575.00	.....

Fig. 6—Monthly Proof of Departmental Absorption of Burden

(In dollars)

Department	Material	Productive labor	Actual burden	Burden absorbed	Burden* under, Over absorbed
Structural	22,000.00	8,000.00	11,000.00	6,660.00	4,340.00*
Plate	7,000.00	2,500.00	3,600.00	2,155.00	1,445.00*
Ornamental	2,650.00	1,500.00	1,500.00	882.50	617.50*
Engineering	.....	600.00	462.50	240.00	222.50*
Total	31,650.00	12,600.00	16,562.50	9,937.50	6,625.00*
Commercial	.....	.....	9,687.50	5,812.50	3,875.00*
Total			26,250.00	15,750.00	10,500.00*
Productive labor			12,600.00	12,600.00	.....
Material			31,650.00	31,650.00	.....
Total			70,500.00	60,000.00	.....

Fig. 6 was made to illustrate a subnormal month or period showing normal burden is not absorbed in subnormal period. Monthly proof of cost accounting is made to show the actual cost of material and productive labor in each department, the actual burden for the month for each department, the actual burden absorbed, the amount of over or under absorbed burden for the month. A monthly recapitulation is also made from the first of the year.

Fig. 7 is intended to show results for approximately a normal year in which the burden is slightly over absorbed.

Any cost system not proved monthly for the current month and for the year to date and annually will almost certainly be misleading and inaccurate. The manufacturing business which does not assemble all of the burden monthly cannot claim to have a cost system, as the accounting or cost keeping department cannot prove the costs and ascertain the amount of under or over absorbed burden in the regular costs.

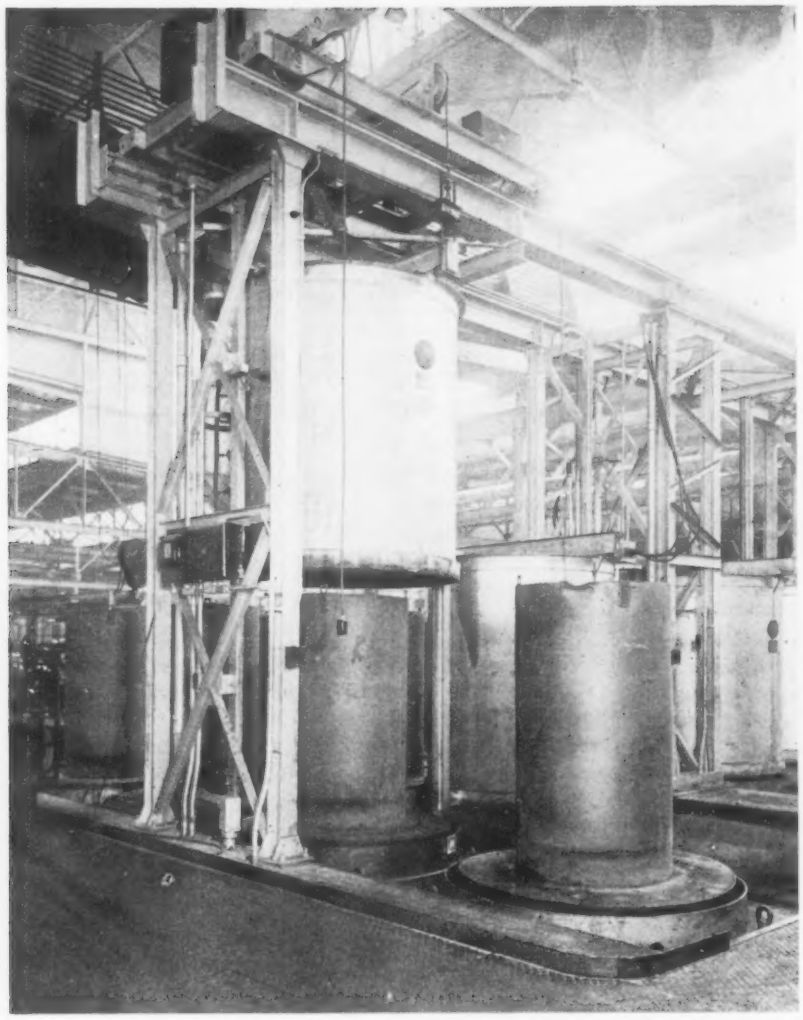
Frequently in the last month of the fiscal year the executives are surprised to learn that there are a great many charges or debits that are made in the last month that are common to the year's business rather than to any particular month, which have not been previously debited or absorbed. It is a very simple matter after maintaining a cost system for several years to ascertain very closely just what these amounts are and they should be included monthly and reserves set up for these to be balanced at the end of the fiscal year.

Many cost experts claim that burden should be absorbed in a limited time, that is three or six months, or at least not longer than one year and the burden rates changed for each period. We contend that this gives flagrantly erroneous results. The most important purpose in cost accounting is to have accurate costs as a guide and control to proper selling prices.

When percentages to absorb burden are frequently changed instead of being spread over a long period to get a proper average, the effect will be in subnormal times or in a depression, when competi-

(Concluded on page 1020)

ANNEALING AN



FURNACE shell raised from second cover, under which the charge has been annealed. The next operation is pushing the bases ahead one base length, bringing under the furnace the charge shown at right.

▲ ▲ ▲

A NEW departure in cold-rolling strip steel is the use of electric furnaces for bright annealing between roughing and finishing passes. The furnace equipment is unusual in that a single set of heating units outside and inside the stacked coils of strip serves for half a dozen bases on which coils are stacked. The first station is for loading, then comes the heating element, followed by successive positions for cooling slowly after heat has been attained. Small platform cars pass the material successively through these positions. After the product has been removed at the last station, the car and base are carried back by crane to station No. 1 to be refilled.

▼ ▼ ▼

STRIP is bright annealed, in the Cuyahoga works of the American Steel & Wire Co., in electric furnaces of the bell type, 24 in number. These are arranged in four groups, six in a group, two groups facing each other with loading space between. While the furnaces were supplied by two manufacturers, they are similar except in some minor construction details.

A furnace unit consists of the cylindrical furnace, a cover to be placed over the charge and an insulated base in the form of a truck, on which the charge is loaded. The bases are located in a concrete pit with their tops at about floor level, and are mounted on wheels for moving them on a track in the bottom of the pit. There are three pits for each group of six furnaces, each pit having two tracks side by side. The pits are 58 ft. long and 15 ft. 2 in. wide, being long enough to hold seven bases although only five bases are used with each furnace at present. There is space in the pit for one base between the furnace and the loading floor. The spaces on the delivery side of the furnace are for holding the bases while the strip is cooling.

Each furnace bell consists of a cylindrical 3/16-in. steel-plate shell encasing the brickwork, the shell being reinforced by a ring around the top. The top is covered with steel plate across which is a double channel beam, to which a lifting fixture is attached. At the bottom is a flanged ring to support the brickwork and insulation. The furnace is 6 ft. 2 in. in diameter outside and 7½ ft. in height.

Heating units located along the sides of the furnace are supported on hooks built in recesses in the brick wall of the furnace lining. Others are in a heating unit that extends from the top down through the center of the bell; when the furnace is loaded this reaches down through the center of the coils to the base. About two-thirds of the heat is supplied from the side walls and one-third from the center unit. The heating elements consist of nickel-chromium alloy strip. The central heating units are wound around a support built of rods of heat-resisting steel. The furnace has 90 to 100-kw. capacity. It is operated on three-phase, 220-volt, 60-cycle current.

Cylindrical in form, the inner hood or cover has a 15-in. diameter bore through the center, which forms an inner cylinder. When the cover is on and the furnace is in place, this inner cylinder or inner side of

G AND CLEANING STRIP

STEEL FOR COLD-ROLLING

the cover is within the inner diameter of the coils, and the central heating unit is within the cylinder. The cover is of 16-gage "18 and 8" chrome-nickel steel, manufactured by the American Sheet & Tin Plate Co. With its heat-resisting qualities it is estimated that covers made with this steel will have a life of four years.

The lower part of the cover consists of a horizontal flange and a vertical sealing ring of 3/16-in. steel plate welded together and gas tight. This ring seats in a reservoir of transmission oil in the top of the base, providing an airtight compartment. Four lifting eyes on the top of the cover serve for handling with a crane. The base or body, built of fabricated steel plates and girders, is mounted on four cast iron roller-bearing wheels.

Each furnace will hold a charge of coils with a minimum inside diameter of 16 in., a maximum outside diameter of 35 in. and stacked to a height of 56 in. It will accommodate a charge up to 6 tons, the usual charge being about 2½ tons.

Artificial Atmosphere for Annealing Furnaces

Gas is passed through the inside of the cover and around the stacked coils to maintain a non-oxidizing atmosphere and to carry off oil fumes and other impurities that might discolor the surface of the steel. This is coke oven gas with the oxygen, moisture and sulphur removed, leaving a non-oxidizing gas containing approximately 60 per cent hydrogen. The gas is admitted under 1½-oz. pressure through ¾-in. inlets divided into two branches extending upward through the base, and is carried out through a 1½-in. discharge pipe.

While the strip is in the furnace, both inlet and outlet are opened, the gas passing out into the atmosphere. During cooling the inlet remains open, but the outlet is closed, to maintain pressure within the cover so that no air will get around the charge. The cover, on being lifted from the charge, is passed over a gas flame at the end of a pipe extending a few feet above the floor, and the gas remaining in the cover is thus burned.

These furnaces are individually controlled by recording instruments with front setting dials. Auto-

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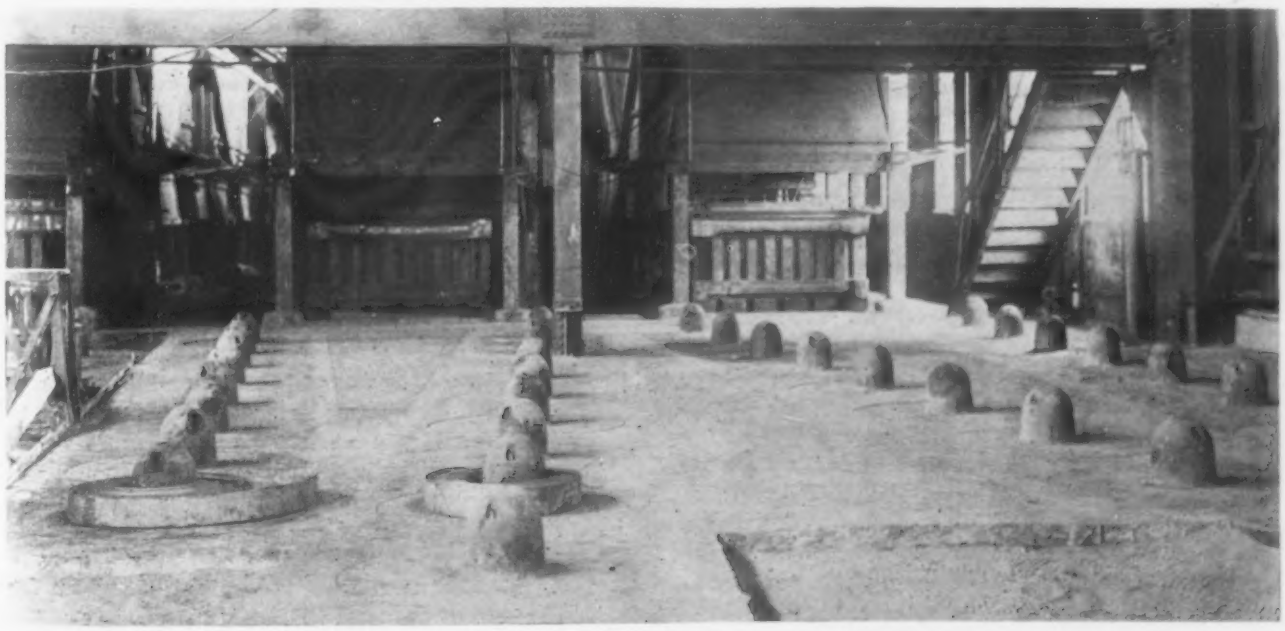
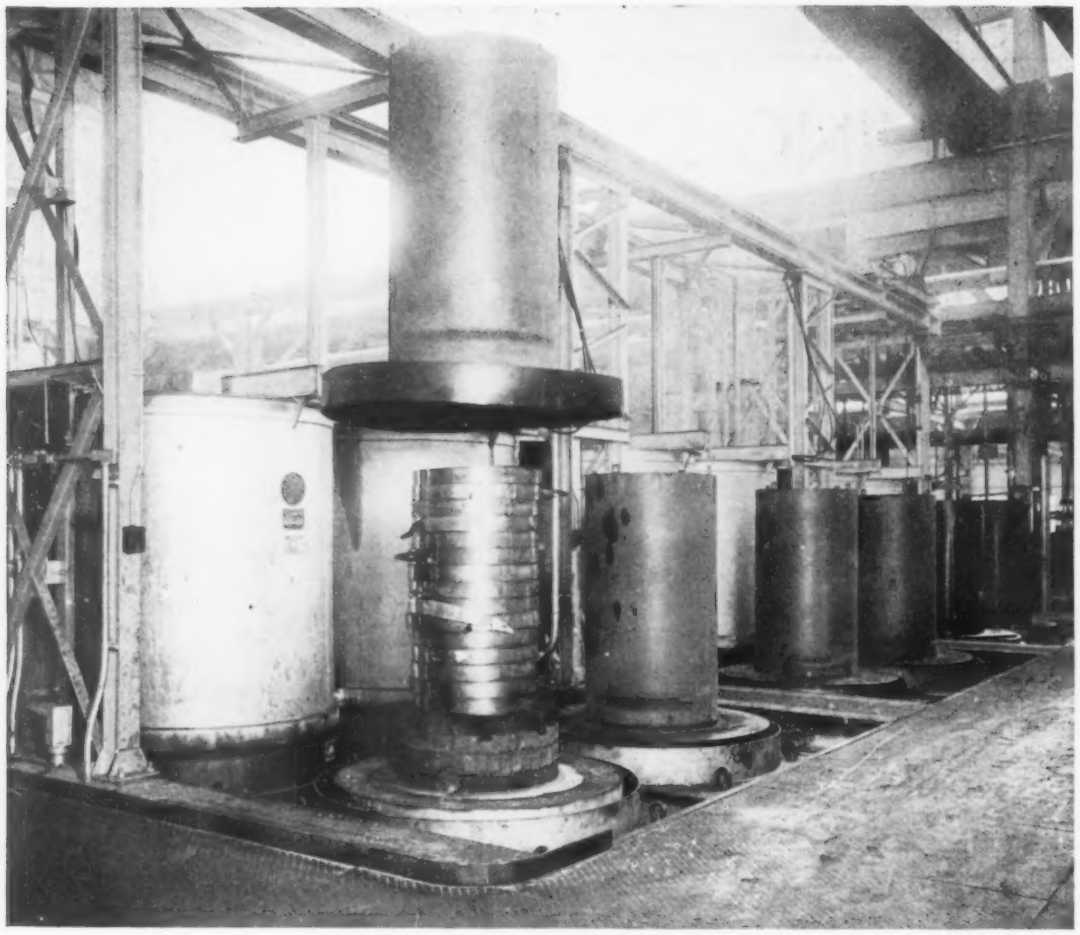
FEEDING end of continuous cleaner. Coils are fed into the cleaner from turntable types of roller-bearing equipped reels (in foreground). These reels save considerable labor in handling coils.





GROUP of electric furnaces for bright annealing coiled strip. In the foreground are furnace bases loaded with strip, the cover of one about to be lowered over the bundles.

matic control panels, one for each instrument, are located in sets at the side of each group of furnaces. Temperature inside the furnace but outside the inner cover is kept to within a range of 10 to 15 deg. plus or minus. As a safety feature, all open bus-bars and cables are protected by Cyclone fence.

Each battery of six furnaces is served by a motor-driven crane mounted on a crane runway extending across the top of the line of furnaces, for raising and lowering the furnace. The building is served by two 7½-ton overhead electric traveling cranes, which handle the work covers and furnace bases. The cranes are equipped with electric magnets.

Sequence of Furnace Operations

Coils are stacked on the furnace base by the overhead crane and a lifting magnet; the cover is lowered over the charge; the furnace bell is raised from the adjoining base to a height that permits its cover to clear the bottom of the bell. Then the row of five loaded bases is pulled forward one base length by a cable underneath the base, attached to a motor-driven drum and hooked to the car just loaded, and the furnace is lowered over the new charge. The furnace is kept in alinement in its up-and-down movement by two guides at the sides. Three or four charges are standing on bases and under covers in the cooling process. When the charge on the last car is cooled, the overhead crane picks up the cover, unloads the strip and carries the cover and base back to the loading end.

Strip is annealed at various temperatures up to 1600 deg. F., the temperature usually ranging from 1250 deg. to 1400 deg. F. The heating time is 6 to 10 hr., depending on the weight of charge; the approximate cooling time is 24 to 32 hr., making the total time 30 to 42 hr.

Advantages of Electric Annealing

A large amount of experimental work was conducted with one furnace before the company adopted the electric annealing process. These tests were made to determine the applicability of the electric furnace for bright annealing of strip in coils, the heating and cooling time cycles, annealing temperature, hardness of the annealed product, production possibilities, quality of product, power costs and labor costs. These tests furnished data with which comparisons were made with gas-fired furnaces.

A summarization of the conclusions is that, with the electric annealing furnace, a better quality of product is obtained at a lower fuel cost. The increased cost of electricity for heating has been more than overcome by the more efficient application of the heat, due to better furnace insulation and less weight of auxiliary equipment to be heated, by speeding up production and by lowering the temperature gradient between the heat source and the point of use, which gives longer life to the equipment.

Higher Percentage of Material Heated

In the electric furnace the weight of strip is 80 to 90 per cent of the total weight of material heated. In

the gas-fired furnace the annealed product comprises only 30 to 45 per cent of the total weight heated. Use of the electric furnace, with more even annealing attained by more accurate furnace control, has resulted in fewer rejections due to improper annealing and to other causes, less re-annealing, reduction in labor costs and more comfortable working conditions.

Cleaning Equipment of New Design

A CONTINUOUS cleaner with various new features in connection with the take-up frame has reeling mechanism of a new design at the loading end. This is saving considerable labor in handling coils in cleaning hot-rolled strip in ¼-in. to 6-in. widths before cold-rolling. With the tendency toward handling strip in larger and heavier coils, attention was given to reducing handling labor at the feeding end of the cleaners.

Newly designed reels are of the turntable type made of cast iron, with a 48-in. base set flush with the concrete floor. The reels revolve on roller bearings. The coil of strip is unloaded from a truck and rolled to the side of one of the reels, over the nub of which it is dumped, requiring little manual effort. These reels replace the usual movable reels that require two rather strenuous hand-lifting operations—lifting the coil on to the reel after the latter is turned over on its side, and setting the reel back in its upright position.

Two Sets of Tanks Used

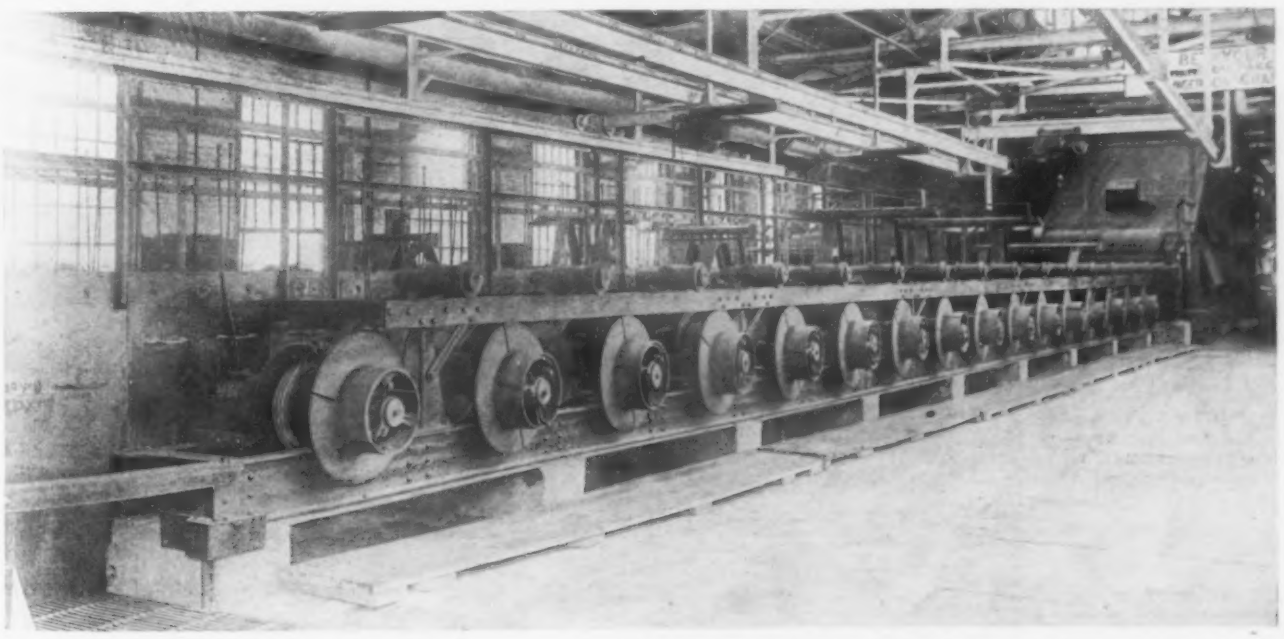
Equipment for recoiling after cleaning consists of a double-frame take-up with 32 blocks, and there are the same number of reels at the loading end. The strip, up to 32 strands at a time, goes through four acid tanks and one cold-water and one hot-water washing tanks. There are two adjoining sets of these tanks, one for each unit.

Strip is drawn through the cleaning tanks by three 14-in. diameter triangularly arranged rolls located at the delivery end. These are driven at a constant, predetermined speed. From these rolls the strip is led to the individual blocks, 16 in. in diameter, 16 on each side of the take-up frame. These are collapsible blocks on 45-in. centers. Slip drive is provided on the blocks to reduce their rotative speed as the bundles become larger. By providing the rolls at the end of the cleaner for drawing the strip through the tank, constant speed of the work through the tanks is assured, as the speed is in no way controlled by the take-up blocks. The strip passes through the cleaner at a speed of 6½ to 26 ft. a minute, depending upon the material.

This take-up frame has various other improved features over those of an earlier, similar unit of the same size occupying an adjoining space in the cleaning room. Each of the two single frames is driven by a 35-hp. motor through a speed reducer, both located beneath the floor. Drive from the reduction unit is through a silent chain to a longitudinal shaft that runs the full length of the frame. Cross shafts driven by a set of bevel gears from the main-line shaft drive the blocks. Coils of strip are lifted from the blocks by two overhead hand-propelled cranes with electric hoists, one serving each unit. These are used also for making repairs.

Lubricating System

Labor is reduced and hazards are avoided by an improved method of lubrication. Above the center of the double take-up frame is a platform for inspection and oiling. The bevel gears pick up their lubrication from a trough running down the center of the frame. Small bearings are lubricated from small pipes leading down from the guard rail at the sides of the platform, making it unnecessary for an oiler to climb down around the gears.



One side of the double take-up frame at the end of the cleaner. Strip, re-coiled on the collapsible blocks shown, is handled from the blocks by an overhead crane.

USES COMPRESSED NATURAL GAS

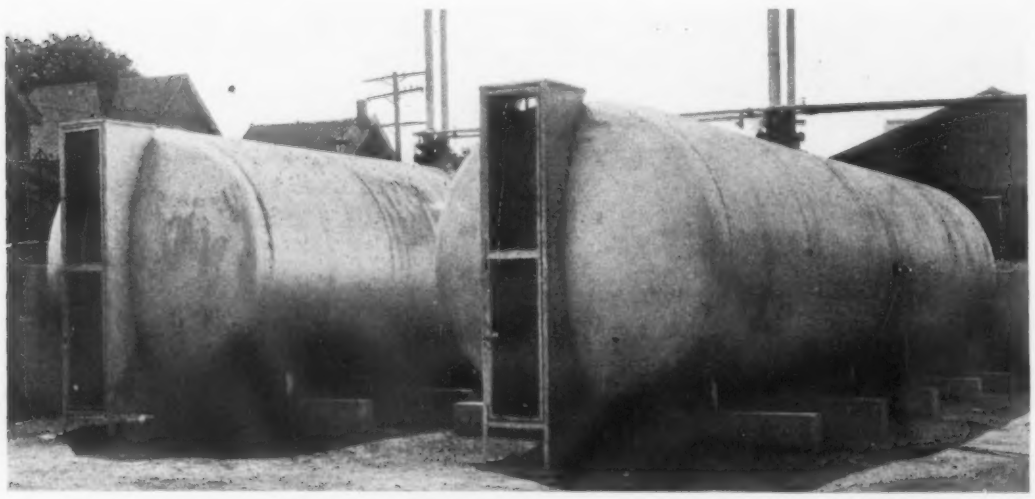
Equipment Required as Exemplified in Milwaukee Tank Plant

SAVING in fuel cost of 25 to 35 per cent has been effected by the Pressed Steel Tank Co., Milwaukee, by changing from the use of city gas to industrial butane gas. The city rate for the amount consumed at this plant averaged about 49c. per 1000 cu. ft. and it had a heating value of 520 B.t.u. per cu. ft.

Butane is received at the plant in its liquid state in railroad tank cars which are of special construction made for the transportation of this gas. These cars have a capacity of approximately 10,250 gal. when filled to the maximum allowable level. Cars, after being placed on a siding, are connected to a 2-in. unloading line, which terminates at two storage tanks, each of 22,500 gal. capacity.

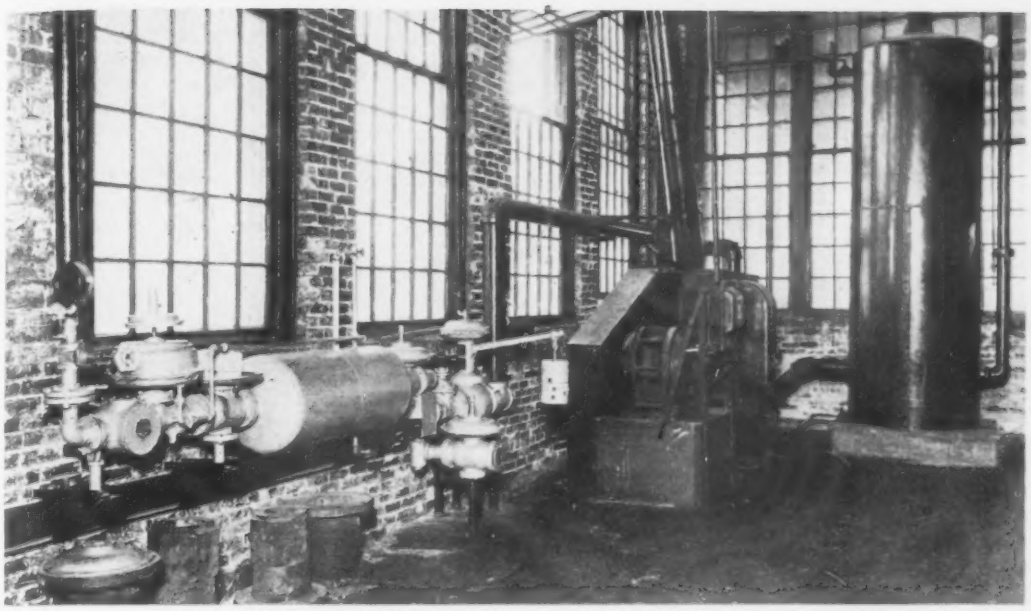
The usual method of transferring the fuel from tank cars to storage tanks is to create a differential of pressure by means of compressed air. There are other methods which may also be used, but the compressed air method is usually the more simple. These tank cars are equipped with heating coils so that if compressed air is not available steam or hot water may be passed through the coils, thereby raising the vapor pressure in the car above that of the storage tanks and forcing the liquid butane to the storage system. Pumps may be used, but this method is not justifiable except for very large installations.

Each storage tank measures 10 ft. in diameter by 40 ft. in length, and is of electric weld construction. The working pressure is 80 lb. per sq. in. These tanks rest on five concrete saddles which project slightly above the ground level. They are anchored to the center saddle. On one end of the tanks are gage glasses to indicate the liquid level. All connections, which are either screwed or welded, are made through the manhole cover. It is interesting to note that each of these storage tanks has a butane ca-

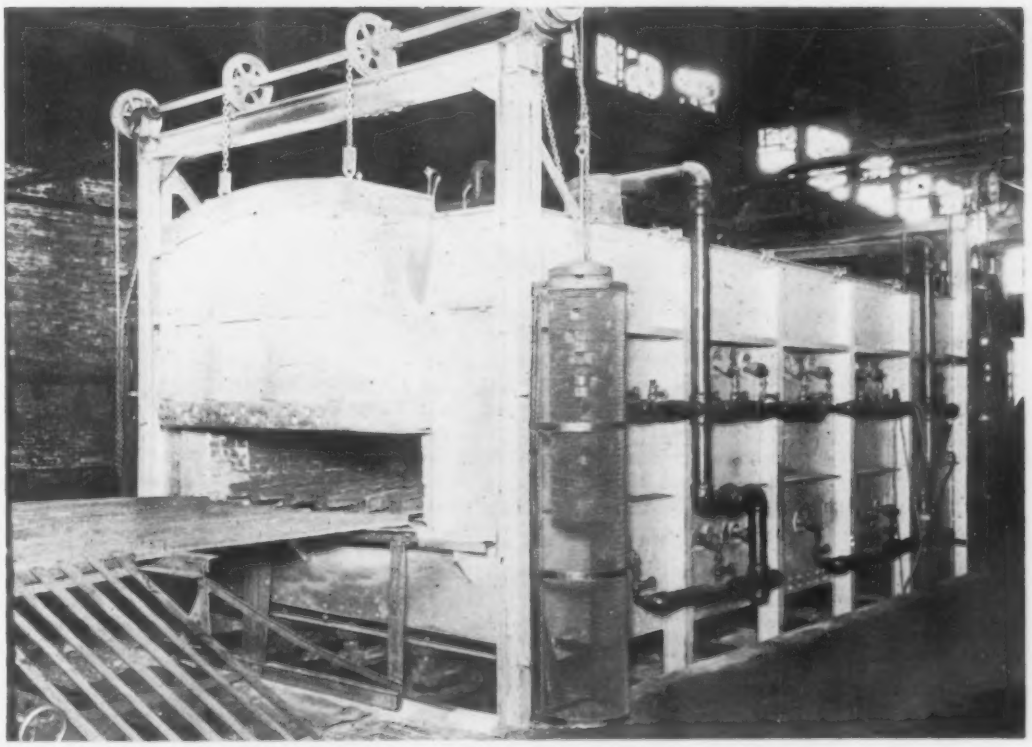


A 2-IN. unloading line connects railroad tank cars to these electrically welded storage tanks, each of which has a capacity of 22,500 gal.

ONE group of brazing furnaces is equipped with low pressure inspirator burners.



AUTOMATIC butane diluting and pressure equipment reduces the gas pressure, introduces air for combustion and then boosts the pressure before the mixture is distributed to the furnaces.



A LARGE walking beam furnace for annealing tanks is fitted with high pressure inspirator burners.

pacity equal in heating value to approximately 4,400,000 cu. ft. of 520 B.t.u. city gas.

Butane being a liquid in its abnormal state, generates sufficient vapor pressure at all normal atmospheric temperatures to force itself from the storage tank through a 2-in. line, which extends to within 2 in. of the bottom of the tank, to a vaporizing unit some 150 ft. distant.

The vaporizing or heat-exchanger unit is located in a small shelter outside of the main buildings. This vaporizing unit consists essentially of a high pressure governor, which reduces the pressure of the liquid from storage tank pressure to about 10 lb. per sq. in., and a heat exchanger which consists of a nest of copper hairpin coils inside of a small drum. Steam at about 15 lb. pressure passes through the coils. The condensate is drawn off through an ordinary low pressure steam trap.

Butane liquid passes in at the bottom of the drum around the hairpin coils, where it is given sufficient heat (latent heat of vaporization) to return the butane to its normal or gaseous state. From the heat exchanger the gaseous butane is piped (at 10 lb. pressure) a distance of about 100 ft. to another governor which reduces the pressure to about 6 in. of water, thence through a small surge tank from which it passes through a diluting valve arrangement and then through another gas governor the outlet pressure of which is controlled by the pressure on the high pressure receiver tank.

The gas then passes into a compressor which raises the butane-air mixture to about 12 lb. pressure and forces it into a supply or receiver tank. This butane-air mixture then passes into the plant fuel lines for distribution to various industrial appliances, where it is used in the ordinary high pressure gas burning equipment. The only additional equipment required to convert this high pressure system from city gas to butane was the small surge tank and the diluting valve.

Butane has a heating value of 3200 B.t.u. per cu. ft. and requires 31.1 parts of air to one part of gas for complete combustion. Since it is not

possible to inspirate this amount of air through large high pressure industrial gas burners the diluting valve was installed. Sufficient atmospheric air is entrained through this valve to make a gas of 740 B.t.u. calorific value with a gravity of 1.22, which combination allows the use of all the city gas-burning equipment by merely adjusting the air shutters.

Products manufactured by the Pressed Steel Tank Co. include high-pressure gas containers, steel barrels, drums and miscellaneous steel containers, particularly a one-piece pressed steel cylinder. To obtain quantity production with fast heating and uniform annealing a gas-fired continuous (walking beam) furnace is employed. This furnace is 7 ft. 6 in. wide and 21 ft. 3 in. in length. It is constructed with 9 in. of fire brick, 9 in. of insulation, and is fired with 40 high-pressure inspirator burners, which are placed on the sides of the furnace both above and below the hearth. An annealing furnace of somewhat smaller dimensions takes the smaller containers. Two small spinning furnaces also are fired with the butane-air mixture.

Other industrial gas-heating equipment includes rivet heaters, preheating furnaces, torches and a large paint drying oven which formerly burned city gas at the ordinary 6 in. of water pressure. To supply these appliances a 2-in. service was connected into the line between the heat exchanger and the low-pressure gas governor. This line carries the undiluted butane for a distance of some 200 ft. to this section of the plant where the pressure is reduced by a low-pressure gas governor to about 6 in. of water. Two tinning furnaces with kettles 5 ft. wide, 3 ft. deep and 8 ft. long, formerly heated by electricity, are being converted to receive butane gas.

The butane consumption varies between 30,000 and 40,000 gal. a month.

A SECTION of the completed rail shows the malleable panels mounted between heavy galvanized pipes.

Malleable Iron Panels for Bridge Rails

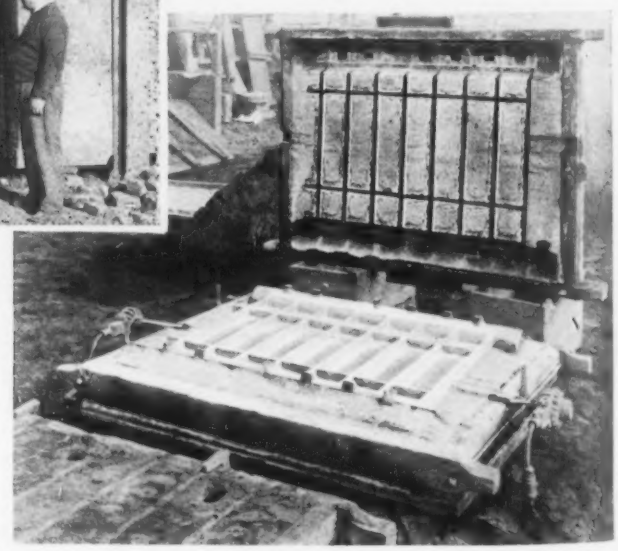
BRIDGE side-rail sections of malleable iron have recently been made on a quantity production basis by the Moline Iron Works, Moline, Ill. These sections or panels were required for the side rails of the bridge and approaches at Lake Union, Seattle, Wash. In all there were cast 1776 pieces; each approach panel weighed 322 lb., and each panel for the bridge span, 251 lb.

Malleable iron used for these castings was made to conform with American Society for Testing Materials specification A-47-30. Metal was melted in 25-ton capacity air-blast furnaces. Floor flasks were of special design and the aluminum patterns were rapped in the molds by means of heavy-duty electric vibrators. To overcome possible shrinks or cracking, 48 iron chills were used and 142 gaggers were set in each mold. Both the chills and the gaggers were set by hand.

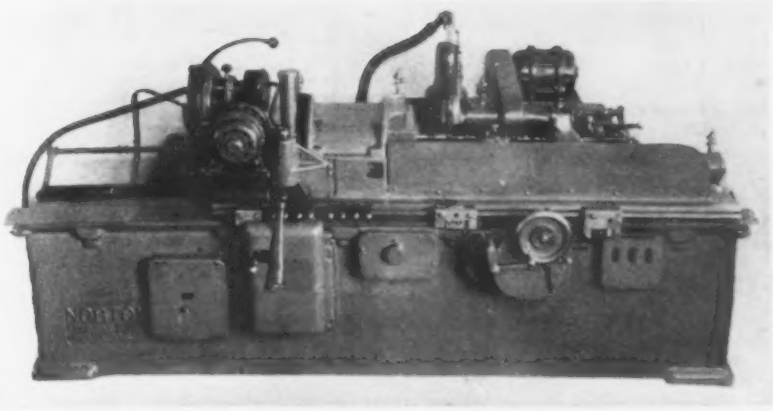
Each casting was cleaned, chipped and inspected before being taken to the annealing department. All castings were annealed in pots, both pots and bottoms being special for this job. No annealing was done in muffle-type ovens. Two test bars were placed in the bottom of each pot.

These multiple-panel malleable iron siderail sections are bolted between two 4-in. galvanized pipes. This structural steel bridge was designed by the State Highway Department of Washington, and the bridge was fabricated and erected by the Pacific Car & Foundry Co.

SPECIAL large pots and bottoms were constructed for annealing the castings.



FORTY-EIGHT iron chills were used to overcome shrinking and cracking and 142 iron gaggers were set in each mold. (At right)



Full Automatic Unit Gives High Output In Grinding Auto Cams

ENTIRELY automatic operation is provided by a new machine which grinds the cams of automobile camshafts with literally no attention except the pushing of the starting button and the loading and unloading of the work by the operator who can run several machines at one time, so little is required of him. It is not an attachment for a standard grinder, but a complete, highly specialized machine for use in factories where internal combustion motors are built on a quantity production basis. Its builder, the Norton Co., Worcester, Mass., designed the machine to reduce cam grinding costs without sacrifice of quality.

Master Cams Control Grinding

Cam contours are ground in essentially the same manner as with the cam grinding attachments that have been standard equipment in the automotive industry. Accurately made model cams are used in special machines for generating the master cams, one of which is required for each cam on the shaft. The master cams are assembled on their spindle and ground to the correct angular relationship.

After a camshaft has been placed in the machine, the grinding operation is started by pressing an electric push button that actuates solenoids, one of which operates the valve controlling the table movements and the other the workdrive clutch. When the table has moved so that the first cam to be ground is opposite the grinding wheel, another clutch engages, thus starting the grinding cycle. The wheel-slide moves forward to grind the first cam, the master cam roller is brought into contact with the required master cam, while a table-stop lever is tripped, positioning it for the next indexing of the table. When the grinding of the first cam is completed, the wheel-slide moves back to its rearmost position and the master cam roller is disengaged from its cam. Simultaneously, the table moves to the second grinding position and the master cam roller contacts the corresponding master cam. This is repeated with each succeeding cam on the shaft.

When the last cam is ground and the wheel-slide reaches its rear position, the table moves to the truing position and a predetermined, though adjustable, truing speed is brought into action. The diamond makes one pass across the face of the wheel, and, as the table carrying the diamond reverses, the work speed is automatically reduced to a finishing speed. After a second pass of the diamond across the wheel face the table continues to move until it positions the work with the last rough-ground cam in front of the grinding wheel, ready for the finishing operation. After the last successive cam has been finish-ground and the wheel-slide is in its rear position, the table moves to the loading position, the work revolution automatically stops, and the clutch is disengaged, bringing to an end the completed cycle. The operator then removes the finished camshaft and reloads the machine. The machine may be used for roughing or for finishing only, in which case the cycle is arranged so that the machine stops when one pass of the table is completed in either direction.

Master cams are furnished for use with grinding wheels from 24 to 22-in. diameter or from 22 to 20-in. diameter. This provides wheel economy where a number of machines are in use, for a wheel worn down to a diameter of 22 in. in one machine may be transferred to another and used down to 20-in. diameter without loss of accuracy.

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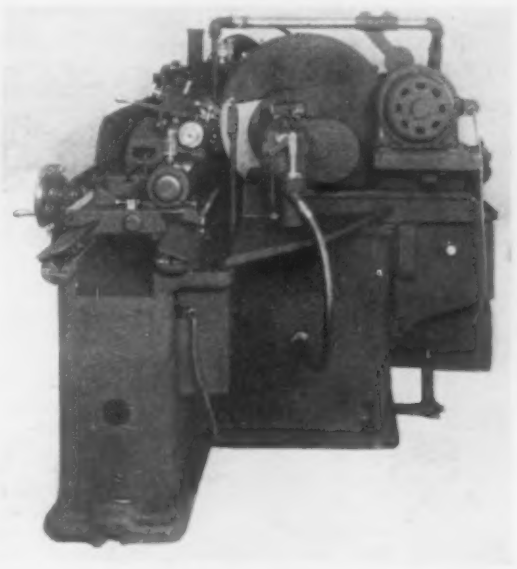
Mechanical Feed for Wheel Truing

Hydraulic feed moves the wheel rapidly to the grinding position and slowly during grinding, the change from one speed to another being automatic. For truing the wheel, there is an adjustable mechanical feed, independent of the hydraulic feed and operated through a large feed screw and adjustable half-nut lapped together and mounted in ball bearings. A graduated hand-wheel permits of manual feed when desired. When grinding, the wheel-slide rests against a stop, thus positively duplicating the location of the grinding wheel for each cam. Two stops are provided, one for roughing, the other for finishing, the change from one to another being automatic.

Operation of the machine requires three constant-speed motors. A 3 to 5-hp., 1800-r.p.m. motor is mounted on the wheel-slide and drives the grinding wheel; a 1-hp., 1200-r.p.m. motor, mounted on the table, drives the work, and a 5-hp., 1200-r.p.m. motor at the rear of the base is direct-connected to the lubricant pump and also drives the hydraulic pump and the cycle mechanism.

The base of the machine is a single casting, as is the table on which are mounted the heavily trussed rocking bar, the diamond tool holder and the bracket supporting the master cam roller and the work-drive mechanism. The table is indexed by means of a hydraulic cylinder and piston; tripdogs carried in a T-slot at the front of the machine correctly position the table for grinding each cam.

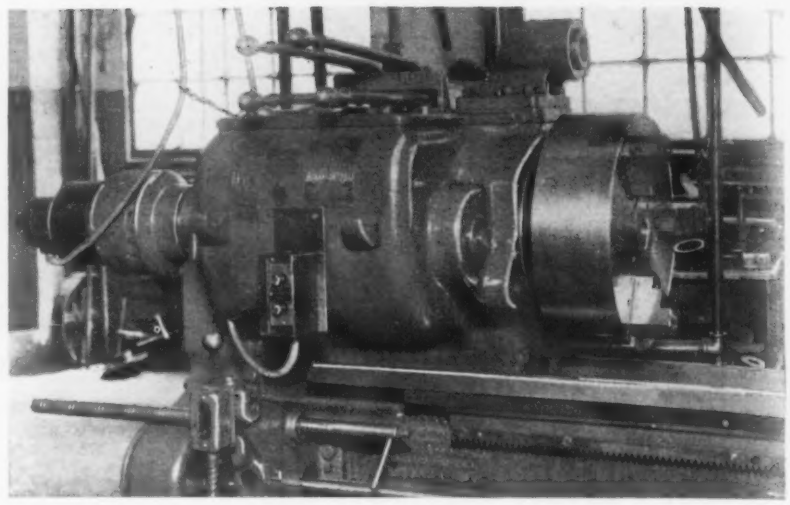
The machine is made in three lengths to take camshafts 36 in., 42 in. and 48 in. between centers. The 36-in. machine, including standard equipment and motors, weighs approximately 12,000 lb.



FRONT view (above) from slight elevation showing camshaft in grinding position. The master cams are extra wide to minimize wear.

Electric Power Chuck Features Rapid Low Cost Operation

By J. W. MARSHALL



AFTER a number of years of experimenting, the Union Mfg. Co., New Britain, Conn., has brought out the electric power-operated chuck here shown.

This chuck is of drawbar wedge type, and is operated normally by a 10 ft.-lb. torque motor that is capable of supplying a pressure of 12,000 lb. at the jaws. When required, larger or smaller motors giving a different range of jaw pressures can be furnished. Attached to the end of a lathe spindle, the motor rotates with the spindle, but only the armature rotates when the operating current is applied. It is controlled by a set of interlocking, magnetic switches and variable resistance by means of which the jaw pressure can be increased or decreased in stages from, say, 1000 to 12,000 lb. to meet requirements. The switches being of the twin type, the chuck is equally suitable for inside as well as outside work without changing any of the electrical or mechanical connections. The action is such that work will not be dropped if the current should be shut off suddenly.

Current Expense Small

It should be noted that the motor housing and chuck are attached as a unit, the motor wires being connected through slip rings. The current is on only during the short interval that the contacting button is held down by the operator. As a result the current consumed is negligible. In fact, the current operating expense is only from 10 to 15 cents a week, where the work is of a nature that frequent opening and closing of the jaws is essential; otherwise this expense should not exceed 25 cents a month.

Connected directly to the motor is a universal reducing gear that drives the pilot-bar unit, which in turn operates the pilot in the chuck. The reducing gear is fitted with ball thrust bearings and with heat-treated chrome-nickel steel gears that run in oil with exterior oilers.

The drawbar has a 2-pitch Acme thread that operates in a nut lubricated from an Alemite grease cup and which is anchored in a radial and thrust ball bearing. It has a 2-in. travel. When current is applied, the chuck wedge, *A*, in the illustration of parts, is drawn backward or pushed forward. As shown, this pilot contains three slanting T-slots that receive the bottom chuck jaws, *B*. The chuck jaws being constrained to move only in a direction perpendicular to the machine spindle are, therefore, caused to move in or out when the motor is running. Top jaws, *C*, are attached to the bottom jaws by means of hollow set screws *D*. The jaws have a ⅜-in. movement in each jaw. By means of mating teeth, the top jaws can be stepped along the bottom jaws and permanently locked.

Chuck Body Designed for Strength

The body of the chuck is made of steel to withstand heavy-duty service. A noteworthy feature of its design is that the loads are not carried on the ribs, all the pressure being brought to bear on the shell and the steel face *E*, so heat-treated as to double the strength of the chuck. This face also protects the working parts from chips and dirt. When wear becomes excessive, after long use, the steel face may be removed and the face of the body machined to bring the face and the jaws back to their original accuracy. The jaws and wearing parts have large surfaces and are made of heat-treated, high-nickel steel, hardened on the wearing surfaces.

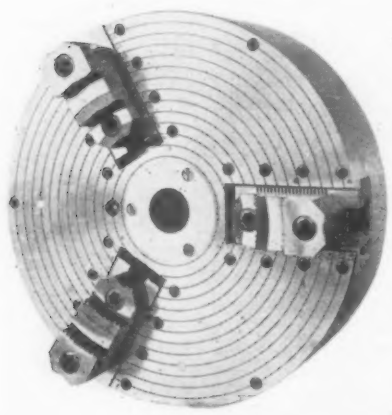
This electric power chuck is designed so that when used in a vertical position, as on a boring mill, no cutting lubricant can seep into the motor. The chucking time is 2 sec. or less, as determined by jaw pressure and other conditions; hence chucking time is turned into cutting time.

Accurate Chucking and Rechucking

Owing to the accurate construction it is possible to chuck and rechuck work within 0.001 in. For example, a piece of work 6 in. long and 4 in. diameter with a jaw grip of 1¼ in. can be turned half way, then reversed in the chuck, and the other half turned, with a difference of less than 0.001 in. variation at the point where the two cuts meet.

Provision has been made for opening or closing the chuck by hand, through a square nut at the outer end of the spindle. Normally the use of this hand-operated device is not necessary, but in the setting up of some jobs it is a convenience.

Minimum of time for chucking is required when the electric chuck is employed; this makes for less expenditure of energy on the part of the operator and frequently permits him to run additional machines. The danger of work coming loose if the power is disconnected is eliminated.



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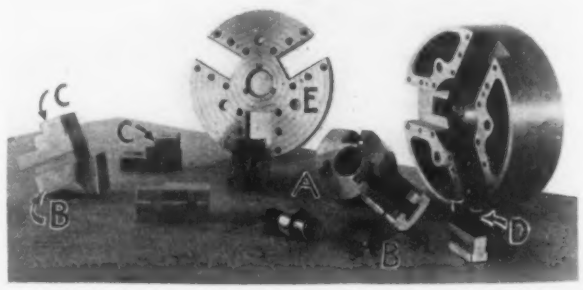
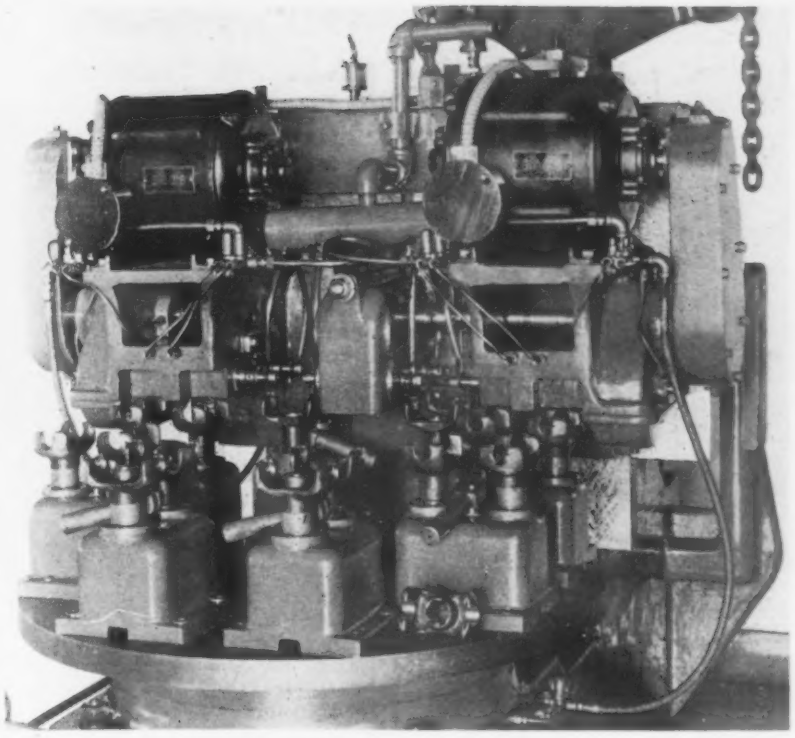
THE chuck unit comprises a few simple parts; it may be air-operated if desired. The electric unit can be applied to air chucks already in use.





High Production in Cutting Grooves in Universal Joint Member

IN cutting the spring retaining groove in one member of an automobile universal joint the machine here shown in close-up completes 800 pieces an hour.

The machine is the No. 50 Producto-Matic miller built by the Producto Machine Co., Bridgeport, Conn., with special fixtures, spindle and spindle-bearing arrangement and special spindle drive. Except for loading and unloading, operation is entirely automatic.

Eight fixtures that hold two pieces each are carried on a four-station rotary indexing table. At each indexing two fixtures, or four pieces, are brought under the cutters; each piece has two cuts, so that the machine makes eight cuts at one indexing. At the other two stations the operator loads and unloads, the fourth station being idle. At the completion of the cut the slide elevates and the table indexes. The bore of the work is splined, as are the work-holding studs of the fixture, and the splines are thus used for locating. Clamping of the work is automatic, but release for unloading is by hand.

Unlike the usual milling machine, these automatics feed the cutters to the work, and a basic feature is that all functions are cam-actuated. In the standard models any stroke of the cutters, horizontal, vertical, angular or curved, is obtainable, but in the machine here shown only a vertical stroke is required and therefore a vertical cutter slide only is employed.

The vertical slide, it may be seen, carries three groups of spindles and cutters, one group of four at the center spindle bearing and two in each of the side bearings. The entire eight spindles are driven by two 1-hp. 1800-r.p.m. motors on top of the vertical slide, the power being transmitted through silent chain to the main drive shafts. Control of these motors, as well as of the 3-hp. motor that, mounted in the base, drives the camshaft and the vertical slide, is by means of push-buttons at the operator's station. Coolant is pumped to a manifold from a reservoir in the base and is piped to the various cutters as shown. The cutters are 1⅛ in. in diameter and run at 500 r.p.m.

Cutter Stroke Is Short

In this and in other sizes and modifications of the Producto-Matic millers, which are particularly adapted for "short cut" work, high production rates are made possible by the elimination of "non-cutting" time. The basic principle is to mill the work at one position while the pieces are being loaded and unloaded at another, and to so locate the work in relation to the cutters that the shortest possible cutter stroke is obtained.

The functioning of the machine may be understood in part from an outline of its major components. Upon a cabinet base is mounted a bed that carries the rotary table and fixtures. The ram, horizontal slide and the vertical slide are the units around which the travel of the cutter bearing of the regular type machine are developed. The horizontal, or main, slide supports a dovetail type ram, the latter providing horizontal movement of the cutters. On the forward end of the ram is mounted the vertical slide which carries the cutter spindle bearing. The horizontal slide is secured to the bed and the ram fits in it. The vertical slide is also actuated by a ram of dovetail type. When only horizontal travel of the cutters is required, the vertical slide is omitted and the cutter bearing is mounted directly on the end of the ram.

Vertical Slide Controlled Accurately

The vertical slide carries the cutter spindle bearing, and when mounted on the ram the ram is bored to receive two compression springs. Pressure applied by a "cut lever" against the top of the vertical slide (the action of the cut lever being obtained through a cam on the camshaft) causes the vertical slide with the cutter bearing to travel downward into the work. When this pressure is released, the springs also release, and the vertical slide rises to its initial position again. This vertical movement can be controlled very accurately, a micrometer spindle and dial at the forward end of the cut lever permitting the depth of cut to be set to 0.001 in. or closer.

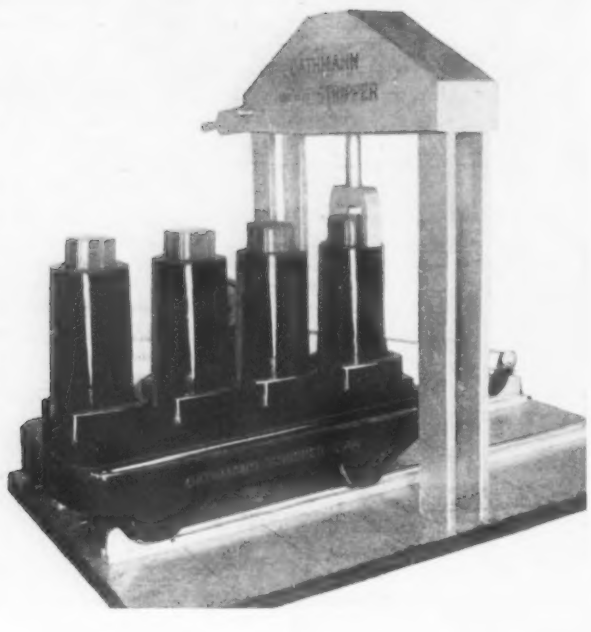
The cut lever has hardened steel rolls which ride on a template mounted on top of the vertical slide. These templates, made of tool steel and hardened and ground, can be designed to give a cut of any contour.

The cams that control all the functions of these machines are mounted at the rear on one hardened and ground alloy steel camshaft.

The camshaft usually carries three cams, but may have as many as five. These include a box-type stroke cam for controlling the horizontal travel of the cutters; the cut cam required for vertical stroke of the cutters; a cam for actuating the plunger that locks the work table and fixture during the milling; an indexing cam; and a cam for automatic clamping of the work in the fixture.

The rotary work table and its vertical spindle is one casting; in the regular machine it is mounted on a carriage that is adjustable longitudinally on the bed. An index plate at the bottom of the spindle functions, together with a yoke and pawl, to index the work table and fixtures. A locking ring on the underside of the work table is provided with slots that serve as the indicating points of the fixtures, and by means of these slots accurate alinement of the fixtures in relation to the cutters is obtained.

Except for the spindles, the machine illustrated is equipped with Timken roller bearings throughout. The side spindles are mounted in ball bearings and the center spindles in bronze bearings. The machine is 42 in. wide, 74 in. long, and weighs 8500 lb.



Position of the molds and partially stripped ingots on the special new big-end-up stripper car. Upward movement of the ingot is limited by the overhead device shown over the end mold

New Stripper for Big-End-Up Ingot Molds

A NEW stripper has been designed for tonnage production of Gathmann big-end-up ingots. It can be successfully and economically used in the production of any sinkhead type of Gathmann big-end-up ingot, but was especially designed to make tonnage production of open and rimming steel ingots in big-end-up molds economically possible, says a statement by the Gathmann Engineering Co., Baltimore.

Prior to this invention, non-sinkhead ingots of the big-end-up type have been produced in small quantities and stripped by removing the mold, with the contained ingot, from the car or stool, up-ending the mold and dumping the ingot upon the floor. The ingot is then carried by a crane to the soaking pit or reheating furnace. When a sticker occurs, the mold and contained ingot are removed to a stripper mechanism, which breaks the contact of the mold and ingot. This method is so expensive and delays production to such an extent that big-end-up non-sinkhead ingot production has heretofore not been considered practical in tonnage plant practice.

Details of the Method

So far as known, the new stripper provides the first practical method of producing big-end-up ingots without sinkheads. The new method consists of seating a mold of the Gathmann big-end-up type with its bottom opening disposed in substantial axial alinement with a stripper rod, which is carried by a supporting stool mounted upon a suitable car or ingot buggy. The opening in the bottom of the mold is sealed by means of a duplex closure, which closure is positioned above and out of contact with the stripper rod carried by the stool. After the ingot is cast and has partially solidified, the stripper rod is raised to move the ingot upwardly, while the mold is held against upward movement by an overhead device. No stress is transmitted to the car or track at any time because of the stripping force being applied.

When the ingot has been raised the desired distance in the mold, the stripper rod is automatically locked and the ingot maintained in the raised position, the upper portion projecting above the mold top. The car carrying the molds is then moved to the vicinity of the soaking or reheating pit and the ingots are removed from the molds by the pit or charging tongs in the usual way.

With the new method, it is stated, ingots can be stripped very much earlier than is possible in big-end-down production. In this way reheating costs will be reduced. The earlier stripping is possible because the pressure is exerted against the bottom of the ingot, which is first to cool and solidify, whereas in big-end-down production, the pressure is of necessity exerted against the top of the ingot where the ingot is hottest.

Life of Mold Lengthened

By early stripping, or rather partial stripping, of the ingot, the mold life is lengthened and solidification of the ingot hastened, it is said, because an induced air current will pass between the inner mold walls and the surface of the ingot when it is in its raised position in the mold, cooling both the ingot and mold body. As the molds can be used at shorter intervals, fewer molds are necessary to take care of the plant's output. United States and foreign patents now granted and pending broadly cover the new method and apparatus.

1931 Supplement to A.S.T.M. Standards

The American Society for Testing Materials has issued the 1931 supplement to the 1930 Book of A.S.T.M. standards. The Book of Standards is issued only every third year, and the standards which are adopted by the society in the intervening years are published in supplements, which bring up to date both parts of the Book of Standards, namely Part I, Metals, and Part II, Non-Metallic Materials.

The 1931 supplement is a pamphlet of 144 pages, containing 32 standards adopted or revised by the society on Sept. 1, 1931. Seventeen of the standards are new and 15 are replacements of existing standards. The Book of Standards, Parts I and II, together with the 1931 supplement contain all of the 443 standards of the society now in effect. A complete list of these, and the tentative standards as well, is given in the back of the supplement. Of the 32 standards published in the 1931 supplement, seven relate to metals and 25 deal with nonmetallic materials.

Carbon Tool Steels That Pass Severe Tests

An attractive pamphlet, which in many respects is a small textbook, has just been published by the Carpenter Steel Co., Reading, Pa. It is entitled, "Tough Carbon Tool Steel." It is an exposition of a new straight carbon tool steel, which is claimed to be tougher and stronger than any water-hardening tool steel ever before made. Describing it as a steel that will successfully pass two severe tests —the hot acid etch and the timbre tests—the pamphlet goes into considerable detail in discussing how these tests are made and what they indicate, with copious examples and illustrations. It contains much information that is instructive and valuable to the tool user and heat treater.

Hack-saw blade manufacturers, distributers and users have reported favorable results from simplified practice covering that product. Among the benefits are reduction in inventory, handling charges and selling expenses, together with increased turnover and expedited deliveries, according to a statement from the division of simplified practice, National Bureau of Standards.

A contract for corrugated galvanized metal culverts amounting to more than $500,000 has been awarded to the Canton Culvert Co., Canton, Ohio, by the Division of Highways of Pennsylvania.

OFF THE ASSEMBLY LINE

Credit Mobilization Plan Cheers Leaders of Automobile Industry

DETROIT, Oct. 12.

DESPITE the fact that the automobile industry is now at the lowest production point since December, 1929, sentiment in Detroit has taken a more cheerful turn. President Hoover's plan for relieving the tenseness of the country's credit situation is looked upon by automotive executives as the first step toward dispelling the hysteria which has gripped people and exerted a partially paralyzing effect on retail automobile sales. Alfred P. Sloan, Jr., General Motors' head, has heartily endorsed the plan, while the Hudson Motor Car Co. went so far as to ask its dealers to urge their local bankers to give practical backing to Mr. Hoover's program.

There is still another reason for the more optimistic tone in the local trade. Although Ford and Chevrolet are making few cars this month, steel mills have booked orders indicating that work on new models will begin soon. Ford is reported to have placed steel for certain parts for the first 50,000 of its new cars; Chevrolet has issued releases of steel tonnage for late October and early November delivery when 1932 models will be in production. Other makers, including Buick and Hudson, likewise are asking for early delivery on certain steel items. Moreover, steel makers are of the opinion that before the end of the month the automobile industry and allied lines will have made purchases in considerable volume.

Detroit has taken philosophically the disappointing output in September, estimated at 142,651 units by the National Automobile Chamber of Commerce. This is some 40,000 cars below the expected showing and is attributed in large measure to the inactivity of the Ford Motor Co., although there was a drop in assemblies by most companies. Total sales by General Motors to dealers last month

September motor car output estimated by National Automobile Chamber of Commerce at 142,651 units, or total of 2,196,129 units during the first nine months of the year.

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General Motors and Chrysler last month made 60 per cent of all cars manufactured. General Motors' sales to dealers were 58,122 units compared with 70,078 in August and 78,792 in September, 1930.

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Passenger car sales in United States this year expected to be 1,900,000, truck sales 325,000. New car stocks at present are low, averaging only two cars to a dealer.

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Several companies in medium-price class may offer cars next year to compete with Ford, Chevrolet and Plymouth, in the belief that depletion of public's buying power insures a "cheap" market for at least the next two years.

were 58,122 units, including Canadian business and overseas shipments, compared with 78,792 in September, 1930, and 70,078 in August. September assemblies of General Motors and Chrysler amounted to 81,881 cars, leaving only 60,770 cars which were made by the remainder of the industry, including Ford. As the Ford Motor Co. no longer issues monthly figures on its operations, it is impossible to tell what portion of the total it turned out.

Motor car production in the first nine months of 1931 is estimated at 2,196,129 units, or 28 per cent under that for the same period last year. It can be stated conservatively, therefore, that the year's total is not likely to be more than 2,700,000, as against 3,500,000 in 1930. It is believed that new car sales in the United States this year will be about 1,900,000 units, and trucks 325,000. Canadian sales probably will be 100,000 units. In explanation of the difference between production and sales, it must be remembered that much of the output toward the end of the year will not find its way into retail circles until 1932. Retail stocks are at a low point. This is shown by the General Motors figures for September, when sales to consumers exceeded sales to dealers by 3845 units. R. H. Faulkner, president of the Auburn company, stated recently that stocks of Auburn cars averaged only two for each dealer; this condition is believed to be fairly representative of the entire industry.

Invasion of Low-Price Field Expected

Realizing that sales during the remainder of the year are certain to be meager, because of seasonal conditions, the imminence of new models and the money-hoarding policy of the public, automobile executives have turned their attention almost exclusively to plans for 1932. This brings into the foreground the conviction on the part of the industry that in the next two years the companies which expect to make reasonable profits must do so in the low-priced field. In other words, the industrial depression has depleted the buying power of the public to such an extent that, even if business materially improves next year, a cheap market is likely to prevail until at least the end of 1933. Therefore, the company which can manufacture a good car to sell in a low-price class will be the one in the best competitive position. With this idea pretty well fixed in the industry's mind, reports

are current about various makers now in the medium-price group which are planning an invasion of the field heretofore confined to Ford and Chevrolet until Plymouth stepped into the market recently.

The most persistent report is that the Studebaker Corpn. will shortly move machinery and other equipment into its local plant at Brush and Piquette Streets, which has not been used for several years, for the purpose of manufacturing an automobile in the low-price class. The Studebaker report is believed to be linked with the plans of George M. Graham, who recently announced that a new six-cylinder car will be made in Detroit next year by a well-known motor car builder. The identity of Mr. Graham's backers will not be revealed until next month. The Hudson people likewise are said to be desirous of putting Essex into a stronger position against Chevrolet and Plymouth and are directing their energies to that end.

In any event, Ford and Chevrolet will not have the low-price field to themselves next year as they did during the first half of 1931.

The addition to the Murray Body plant at Ecorse, Mich., for the production of Ford frames will probably be completed by Nov. 1. Since this plant is next door to the Great Lakes steel mills and there is no switching charge for delivery of steel, Great Lakes is expected to supply the bulk of Murray's steel requirements.

Franklin has reduced its prices as much as $500 on certain models. DeVaux-Hall has cut its standard sedan $10 to $685, f.o.b. factory, but has increased other body types $35 to $70.

Orders placed by the Ford company continue to indicate that production of the new car will not start until some time in November. The steel plant and foundry at Rouge are still closed, with retooling of manufacturing departments the main job at the moment.

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British Iron and Steel Industry Expands Operations as Trade Increases

(*By Cable*)

LONDON, ENGLAND, Oct. 12.

SENTIMENT in Great Britain is improving with many indications of a general increase of activity including revival of the textile industry. Domestic demand for pig iron is distinctly better, many consumers anticipating import tariffs. Exports of pig iron are difficult to arrange because of the fluctuating exchange, but some business including hematite iron has been closed with Central Europe.

Makers of sheet bars are heavily booked with business and in a better position than for some years. The Bryngwyn Gorseinon bar mills have resumed operation this week after being practically closed for two years. The Grovesend Steel & Tin Plate Co., has started a fifth open-hearth furnace.

The Standard Fruit & Steamship Corpn., New Orleans, has contracted for a steamship with Workman, Clark & Co., Ltd., Belfast, and Hogarth & Sons, Glasgow, have placed a contract for a 6500-ton vessel with David Henderson & Co., Glasgow.

Considerable difficulty is encountered in clearing up current contracts with Continental mills, as the foreign suppliers frequently demand payment in the gold equivalent, although the contracts merely call for the pound sterling. Meanwhile, certain European mills are willing to sell on a basis of the paper pound sterling.

On the basis of the current sterling exchange, Continental sheet bars have been sold at £3 17s. to £3 18s. ($14.81 to $15) f.o.b., and steel bars have been offered at £4 to £4 2s. 6d. a ton (70c. to 71c. a 100 lb.) f.o.b. United Kingdom consumers of semi-finished steel are moderately interested in importing foreign material in view of the possibility of a tariff.

Tin plate is in active demand with prices advancing and inquiry well distributed, especially from Continental, Far Eastern and domestic sources. Mills are booking orders for delivery into next year and merchants are more optimistic than in many months.

Galvanized sheet business is quiet with only a few small sales to China and other Far Eastern markets and Indian demand limited following advance of the tariff there by 25 per cent.

Argentina has increased the duty on sheets 10 per cent effective for one year. There is some demand from the Far East for black sheets, but the market is otherwise quiet, and further sales to Argentina are likely to be affected by the tariff increase.

Members of the Continental Wire Rod Cartel will meet in Düsseldorf, Germany, Oct. 23, to discuss renewal of the agreement. The Schweizerische Treuhandgesellschaft which was appointed to supervise the output of individual members of the Continental Steel Cartel has suspended activity, creating the belief that the cartel has virtually ceased to function as far as output control is concerned.

It is expected that the Franco-German Economic Commission, when formed, will include leading steel producers in both countries, which may

British and Continental European Export Prices f.o.b. United Kingdom Ports, Hamburg and Antwerp

British Prices, f.o.b. United Kingdom Ports

Per Gross Ton, £ at $3.85

Ferromanganese, export	£9	0s.				$34.65		
Billets, open-hearth	5	5	to	£5	12½s.	20.21	to	$21.65
Black sheets, Japanese specifications	9	10	to	9	15	36.58	to	37.53
Tin plate, per base box (nom.)	0	14	to	0	15¼	2.69	to	2.88
						Cents a Lb.		
Steel bars, open-hearth	7	17½	to	8	7½	1.35	to	1.44
Beams, open-hearth	7	7½	to	7	17½	1.26	to	1.35
Channels, open-hearth	7	12½	to	8	2½	1.31	to	1.40
Angles, open-hearth	7	7½	to	7	17½	1.26	to	1.35
Black sheets, No. 24 gage	8	5	to	8	10	1.42	to	1.46
Galvanized sheets, No. 24 gage	9	15				1.68		

Continental Prices, f.o.b. Antwerp or Hamburg

Per Metric Ton, Franc at 3.95c.

Foundry iron, 2.50 to 3.00 per cent sil., 1.00 per cent and more phos.	286 fr.	to 289 fr.	$11.30 to $11.42
Billets, Thomas	344 fr.	to 350 fr.	$13.61 to $13.85
Wire rods, low C., No. 5 B.W.G.	585	to 615	23.09 to 24.30
Rails, light	740		29.20
Black sheets, No. 31 gage, Japanese	1384	to 1476	54.68 to 58.32
			Cents a Lb.
Steel bars, merchant	381	to 383	0.69 to 0.70
Beams, Thomas, British standard (nominal)	381	to 387	0.69 to 0.70
Channels, Thomas, American sections	689	to 701	1.24 to 1.26
Angles, Thomas, 4-in. and larger, over ⅜-in. thick	378	to 384	0.68 to 0.69
Angles, Thomas, 3-in.	387	to 393	0.69 to 0.70
Hoops and strip steel over 6-in. base	492	to 510	0.90 to 0.92
Wire, plain, No. 8 gage	615	to 624	1.09 to 1.10
Wire, barbed, 4-pt. No. 12 B.W.G.	1045		1.87

lead to reorganization of the Continental Steel Cartel.

The International Rail Makers' Association has reduced rail prices 12s. 6d. a ton to £5 17s. 6d. ($28.55), and will hereafter use the gold pound sterling as an accounting unit.

Tonnage booked by Belgian steel mills has increased and the decision to reduce wages 5 per cent, effective Oct. 16, has caused grave unrest with the possibility of strikes. French unemployment, however, is increasing and the Societe Anonyme des Forges et Fonderies de Montataire has closed its Frouard plants.

German steel output in Upper Silesia shows a downward trend with but little prospect of an increase in demand. Export sales have been adversely affected by depreciation of the pound sterling. Export business of Luxemburg is negligible and the Ougree-Marihaye works is blowing out two furnaces at Rodange.

The Franco-Polish consortium, which is constructing the Gdynia railroad has placed orders for 18,000 tons of rails with the Koenigs-Laurahütte and 7000 tons with the Friedenshütte.

United Kingdom exports in September were 12,000 tons of pig iron, of which none went to the United States. Total iron and steel exports were 139,000 tons.

French production in August was 682,000 tons of pig iron and 645,000 tons of raw steel. Polish output was 30,000 tons of pig iron, 100,000 tons of raw steel, 73,000 tons of rolled steel and 5000 tons of steel tubes.

September production of the Western Steel Trust in the Soviet Union was 313,000 tons of pig iron and 239,000 tons of open-hearth steel. Output of the Eastern Steel Trust was 69,000 tons of pig iron and 55,000 tons of open-hearth steel.

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India Places Duty On Textile Machinery

WASHINGTON, Oct. 13.—In a revised budget presented to the Indian Legislative Assembly, textile and printing machinery has been removed from the free list and will be dutiable at 12½ per cent, says a radiogram to the Department of Commerce from Calcutta. The measure became provisionally effective Sept. 30, and is expected to continue in force until March 31, 1932.

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German Cartels May Buy Used Machinery

HAMBURG, GERMANY, Sept. 30.—Recent public sales of machine tools and other equipment from German plants, which were forced to liquidate because of the financial situation, have brought prices 10 to 15 per cent of the original value for comparatively new tools. At an auction a few weeks ago, bolt, nut and rivet making machines, which had been in use for only about 18 months, were sold at 11 per cent of the original cost.

These low sale prices have stimulated small investors, inexperienced in manufacturing, to buy such machinery and enter into production. Although the quality of their products is usually inferior, these new producers have a very small initial investment for equipment and are able to sell at prices well under the usual level.

To correct this condition, certain cartels plan to bid for machine tools and other equipment and whenever possible resell them for export. Should foreign buyers not be found for this equipment, the cartels may scrap it regardless of age or condition to prevent its use for low-priced production in Germany.

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Prominent steel men expectd to be on Franco - German Economic Commission, to be formed soon.

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Belgian steel mills' decision to reduce wages 5 per cent develops unrest, as increasing tonnage is being booked.

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Indian and Argentine tariff advances on sheets curtail British export business.

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Production machinery of liquidating German plants sold at 10 to 15 per cent of original value.

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German company develops special foundry pig iron with finely granulated graphite content.

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All German Locomotive Shops May Suspend

BERLIN, GERMANY, Sept. 29.—If additional orders for locomotives are not booked by German shops in the next few weeks, it is believed that the entire industry may be forced to suspend by the end of this year. Unfilled orders in September were only about 40 locomotives, and no new business has been taken recently.

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Faraday's Alloy Steels Used For Knives

LONDON, ENGLAND, Oct. 3.—In the light of his electrical and chemical work, the greatness of Michael Faraday's metallurgical achievements has been greatly underestimated, according to Sir Robert A. Hadfield in an address to the British Association during the recent Faraday centenary celebration. Faraday's metallurgical researches were his first, and were undertaken primarily to obtain materials better than ordinary carbon steel for knives, surgical and other instruments, and to discover alloys less susceptible to rust and tarnish.

Research on 79 specimens of alloys made by Faraday himself between 1819 and 1824, and preserved at the Royal Institution, was carried out by Sir Robert A. Hadfield, who prepared a number of small knives from one of the Faraday alloys. These knives were presented to officers of the British Association and distinguished scientists who attended the meeting.

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New Special Pig Iron Made In Germany

DÜSSELDORF, GERMANY, Sept. 30.—A new type of foundry pig iron, known as "Migra-Eisen," is being made commercially by the Vereinigte Stahlwerke A. G. The feature of this iron is its finely granulated graphite content, which can be regulated by the producer to suit the requirements of the consumer. The maker claims that even when remelted a number of times it retains its original quality and physical properties. It is being furnished in two standard grades: high and low phosphorus content.

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Japan's Scrap Imports At Low Level

YOKOHAMA, JAPAN, Sept. 4.—Imports of iron and steel scrap from the United States have recently declined to 5000 or 6000 tons a month, and the total for this year is not expected to be more than 80,000 tons. Scrap is still being imported from the South Sea sources, but Japanese consumers are using increasing tonnages of pig iron, which is low in price because of competition between the domestic product and imported iron from India.

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German Office Machine Plant Closed

BERLIN, GERMANY, Sept. 29.—The plant of the Mercedes Bureaumaschinen Werke A. G., (Mercedes Office Machinery Co.), which was recently acquired by the Underwood-Elliott-Fisher Co. of the United States, has been closed and about 1000 workmen and office employees dismissed.

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A proposed recommendation covering sizes of arbor holes for circular saws and grinding wheels used on portable electric hand-saws has been dropped from the schedule of the division of simplified practice, National Bureau of Standards. Although manufacturers are said to favor simplification, the sizes and shapes suggested in the recommendation were not approved.

Automotive Production Men Discuss Industry's Problems

Welding, Cleaning and Preparation of Metal Surfaces, Permanent Molding and Other Subjects Considered

MANY subjects of interest to the automotive production man, including welding, inventory control, cleaning and preparation of metal surfaces, hot coining and permanent molding, were discussed at the national production meeting of the Society of Automotive Engineers at the Book-Cadillac Hotel in Detroit Oct. 7 and 8. As usual, the national production dinner was an outstanding event. A visit to the plant of the Holley Carburetor Co. was another feature. In view of the depression, the meeting was exceptionally well attended.

All-steel welded bodies for passenger cars have many advantages over composite bodies, declared Joseph W. Meadowcroft, assistant works manager Edward G. Budd Mfg. Co., Philadelphia. Among these advantages are fewer parts, doors of only two pieces, no visible outside seams, lower tops for the same head-room, less roof weight, lower center of gravity, greater safety, increased visibility, permanent quiet, economical upkeep and perfect outside lines. Wood and steel react so differently to stress that neither adds much to the strength of the other in a composite structure. Steel alone, welded into a unit structure, is lighter and less bulky. The entire side of the body is stamped from a single sheet, with the openings die-formed to reinforce it. Chassis frame and body follow the same lines, so that they reinforce each other and body sills can be omitted. This plan saves 2 in. in height as compared with some other bodies.

Mr. Meadowcroft pointed out that the automobile body really is a container designed for transportation purposes. It must have a certain capacity, be strong and serviceable, possess certain conveniences and meet the requirements of good appearance. In the all-steel body the skin or shell is utilized as the chief structural member and is reinforced by additional strengthening members wherever needed. In a sedan there are 2303 spot welds and 140 in. of flash welding. Flash welding is employed to join 120-in. long sheets of any desired width, because mills are not equipped to produce economically and speedily sheets of the required accuracy. The tonneau rear seams are flash welded and the cowl and roof are attached by spot welding. Flash welding of the large sheets requires uncommonly accurate alinement, which is secured by a scarfing operation that trims both edges of the sheet simultaneously. Magnetic clamping makes the pressure self-contained.

The handling of large units for welding small reinforcements, such as those for hinges, locks and fender bolts, is accomplished on a spot welding machine of great flexibility, used in conjunction with overhead carrying equipment. Most electrodes are of hand-drawn copper or a material which contains a large percentage of copper. To secure long life, they are cooled to within ½ in. of their points, wherever possible.

Predicts Greater Use of Permanent Molds

Permanent molds for casting iron are made from the same iron which is poured into them, said J. L. Dostal, manager of the Holley Permanent Mold Machine Co., Inc., Detroit, in his paper on "Casting Iron in Permanent Molds." Master patterns are metal-faced or made from hardwood, no finish being necessary in the impression. The dry sand core made from the master pattern is coated with graphite. The mold is normalized after casting, then machined on its faces and coated with a refractory facing. An additional coating of acetylene smoke is applied automatically in the molding machine before pouring.

Within a few years cylinder blocks and virtually all castings for automobiles will be cast in permanent molds, predicted Mr. Dostal. Progress is being made so rapidly that castings which seemed impossible a few years ago are considered simple now. Standard 12-head, semi-automatic molding machines are used generally for quantity casting. One man pours continuously and another ejects the castings. If cores are required, a third man sets them. Single-head machines are used for small quantities and special machines for castings that are too large for standard machines. Although the supply of trained men is limited, the process is comparatively simple and can be easily taught.

Among the advantages of permanent molding are uniformity in size and hardness of castings and freedom from sand, thus giving economy in machining; saving of space, time and labor in making the castings; and high tensile, transverse, impact and compression strength in the product, with uniformly close grain and freedom from shrinkage. The casting and annealing operations can be controlled to give almost any desired degree of hardness.

Faults of Wrong Cleaning Methods Explained

The most common and troublesome cause of failure in enamel finish of fenders and other sheet metal parts is the development of local or general rust under the enamel, which results from wrong cleaning methods. Occasional failures are due to alkaline traces in the rinse water or to invisible rusting agents on surfaces cleaned for priming, declared F. P. Spruance, American Chemical Paint Co., in a paper on "Preparation of Sheet Metal Parts for Enameling." The most common cleaning practice is to dip the parts in or spray them with boiling solutions of alkaline salts, rinsing them with cold and then hot water to remove the alkali, and finally drying them. Continued use of this process, with modifications, seems assured because of its cheapness.

Extensive research in salt spray and humidity cabinets has revealed an alkali condition of the rinse water to be largely responsible for the failures of the enamel finish. Even where alkali washes were not employed, city water was found to contain enough alkali to leave spots where drops dried and left faint rings of hygroscopic salts which absorbed moisture through the subsequent enamel and created rust that loosened the enamel. The remedy was found in a special form of phosphoric acid which overcomes the surface tension of the drops of rinse water and at the same time neutralizes the alkalinity without creating an acid condition that would itself cause a tendency to rust. The majority of automobile bodies now are cleaned with a mixture of phosphoric acid and oil solvents.

To assure removal of all oil on the sheet metal, said Mr. Spruance, a form of phosphoric acid containing oil solvents is used, after which the parts are rinsed in cold water. After drying, they are "tack-ragged" before priming. Recently the cleaning with phosphoric acid has been supplemented by a separate operation called bonderizing. The need for a separate operation between the alkali rinse and the priming has been eliminated recently by the introduction of a primer containing decomposable phosphates which react with the surface of the metal on baking so as to overcome any rusting tendency and to etch the surface slightly, thereby creating a good bond between the steel and the enamel top coats.

Development of Pressure Machining

J. H. Friedman, National Machinery Co., Tiffin, Ohio, presented a motion picture showing development of machining by pressure as applied to forgings, likewise giving a description of the new process. He pointed to interesting examples of the possibilities of the process for obtaining accurate, low-weight forgings. He also told about the pressure forging of non-ferrous metals and the straightening and sizing of malleable castings by pressure.

Inventories receive first consideration in the financial control policies of General Motors Corpn., stated C. B. Stiffler, Oakland Motor Car Co., Pontiac, Mich., in his paper dealing with inventory control. Formerly it was thought necessary to place orders for

materials far in advance of needs to assure the supply. However, restricting orders to suppliers to three months in advance has been satisfactory for the past 10 years, because of the cooperation on the part of suppliers and the transportation agencies.

Each car division of General Motors now submits monthly a forecast based on 10-day reports of stocks and of actual and estimated sales of dealers. This forecast, covering the current and three forward months, estimates the number of cars to be sold by dealers, delivered to them, and manufactured. Official acceptance of the forecast is authority for the division to proceed with manufacturing and with procurement of materials. However, adjustments may be made during the month.

Three Days' Supply Sufficient

In place of large stock rooms, said Mr. Stiffler, a limited amount of space is assigned for stock near the point where processing begins. The plant is zoned, with an experienced man in charge of stock in each zone. He has little use for any record except a shortage report showing what items need attention. The efficiency of handling materials has been so improved that a supply for three days is now normal. Minimum banks of processed parts also are maintained. As an example of the speed in handling materials, Mr. Stiffler mentioned that a carload of frames loaded in Milwaukee on Thursday afternoon arrived in Pontiac Friday morning, was assembled into automobiles and a carload of cars shipped Friday afternoon to Milwaukee and delivered to retail purchasers on Saturday afternoon. Capital invested in inventories and in buildings to house them is estimated at 25 per cent of what it would be if no improvement had been made in the last decade. The cost of moving material is only 20 per cent of what it formerly was.

Radical changes in design of automobiles were forecast by Louis Ruthenberg, president Copeland Products, Inc., Mount Clemens, Mich., in an address at the production dinner. Mr. Ruthenberg was connected with the motor car industry for 20 years before he went into electric refrigeration. He declared that the so-called "tear-drop" body probably will gain increasing favor. He emphasized the fact that the whole industry, including the production divisions, must become salesminded, for the sales problem today and in the future far outweighs in importance the production problem.

Dr. Phillips Thomas, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., entertained the members at the dinner meeting by a demonstration of "Electrons at Work and Play." A. K. Brumbaugh, chairman of the national production activity committee, was toastmaster.

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Bunting Brass & Bronze Co., Toledo, Ohio, has established a branch sales office and warehouse at 1250 Ontario Street, Cleveland.

▲▲▲ PERSONALS ▲▲▲

GEORGE E. TOTTEN, who has been assistant to the manager of tin plate sales for the Jones & Laughlin Steel Corpn., Pittsburgh, has resigned and has been appointed manager of sales, tin plate division, for the Republic Steel Corpn., Youngstown. He assumes his new duties on Oct. 14. Mr. Totten is a native of Pittsburgh and entered the employ of the Jones & Laughlin company 21 years ago. He has been identified with the tin plate department since the company entered this line of business and had held his recent position for 15 years.

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W. J. FIRTH, chairman of the board, South Wales Tin Plate Corpn., London, England, has been elected chairman of the board of Richard Thomas & Co., the Grovesend Steel & Tin Plate Co. and subsidiary companies. He succeeds HENRY BOND, who has retired.

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HARRY L. ERLICHER, who entered the employ of the General Electric Co. as an office boy in the purchasing department, has been appointed purchasing agent, succeeding L. G. BANKER, who retired on Oct. 1 after completing 43 years of continuous service with the company. Mr. Erlicher was advanced rapidly and was made a buyer in 1910. When the position of assistant purchasing agent was created in 1923, he was selected for the place. Mr. Banker became identified with the Thomson-Huston Electric Co., a predecessor of General Electric, in 1888 as a clerk in the purchasing department of the West Lynn, Mass., plant and was transferred to Schenectady when that city was made headquarters for the General Electric Co. in 1894. In 1914 he was appointed the company's purchasing agent and head of the purchasing department.

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CHARLES O. GUERNSEY, since 1923 chief engineer, automotive car division, J. G. Brill Co., Philadelphia, has been made chief engineer of the company and of its subsidiaries. For 10 years previous he was affiliated with the Service Motor Truck Co., Wabash, Ind., as chief engineer and later as vice-president in charge of the company's railroad division, the activities of which were transferred to the Brill company in 1923.

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PROF. RAYMOND ROARK, of the department of mechanics of the University of Wisconsin, was scheduled to speak on the "Effects of Machining and of Surface Defects on the Strength of Cast Iron" at a meeting of the Wisconsin Gray Iron Foundry Group at the Hotel Schroeder, Milwaukee, Oct. 14.

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C. H. UPSON has been made Cincinnati representative, with office at 1012 Traction Building, of the Union Chain & Mfg. Co., Sandusky, Ohio.

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HARRY J. FISHER, formerly sales manager of the Reliance Electric Engineering Co., Cleveland, has been appointed manager of sales for the Aetna Standard Engineering Co., Youngstown, and will assume his new duties on Nov. 2.

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RALPH B. KRAFT, of 5331 Harper Avenue, Chicago, has been appointed representative for the Hill Clutch Machine & Foundry Co., Cleveland, in the territory covering Illinois, Indiana, Wisconsin, Missouri, Kansas and Minnesota.

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F. E. FLEMING has become sales engineer at the Chicago office of the Riley Stoker Corpn., Worcester, Mass., and R. L. SAUER has been made Detroit district manager. M. L. CORNELIOUS has been appointed district manager at Cleveland, I. W. LACHMAN, sales engineer at the New York office, and W. J. EHMER, sales engineer at the Philadelphia office.

G. E. TOTTEN

H. L. ERLICHER

C. O. GUERNSEY

FREDERICK B. RENTSCHLER has been made chairman of the board of directors of the Hamilton Standard Propeller Co. of Delaware, which is the reorganization of the Hamilton Standard Propeller Corpn., Pittsburgh. RAYCROFT WALSH is president; ARVID NELSON, vice-president; SIDNEY A. STEWART, secretary, and J. REID MILLER, treasurer.

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DR. GEORGE B. KARELITZ, formerly manager of the mechanics division of the research laboratory of the Westinghouse Electric & Mfg. Co., East Pittsburgh, has been appointed division engineer in charge of transportation at the company's South Philadelphia works. His duties will include supervision of the manufacture of marine apparatus, Diesel engines and other equipment. Dr. Karelitz has been with the Westinghouse company since 1922, and during the academic year 1930-1931 he served on the engineering faculty of Columbia University. R. E. PETERSON succeeds Dr. Karelitz as manager of the mechanics division of research.

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EDGAR S. BROWNING has been appointed San Francisco district manager, with an office in the Rialto Building, for the Patterson Foundry & Machine Co., East Liverpool, Ohio. Mr. Browning has been connected with the Pittsburgh Plate Glass Co. for many years.

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W. E. BENNINGHOFF, sales engineer, Cleveland Electric Illuminating Co., has been made chairman of the Cleveland chapter of the American Society for Steel Treating, succeeding W. T. DONKIN, formerly with the Cleveland Wire Spring Co., which has moved to Detroit. ARTHUR S. TOWNSEND, metallurgist, Cleveland Twist Drill Co., has been made vice-chairman.

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P. T. BABCOCK has been appointed sales manager, Pressed Steel Tank Co., Milwaukee, to succeed HERMAN MERKER, who has been placed in charge of market research and development. Mr. Merker also is secretary of the company.

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WILLIAM C. CLAUSON, general sales manager, Outboard Motors Corpn., Milwaukee, sailed Oct. 10 from Vancouver, B. C., to spend four months in surveying markets in the Hawaiian Islands, China, Japan, the Philippines and other points in the Orient.

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EDWARD R. ROLL has resigned as assistant manager and general superintendent, Demountable Typewriter Co., Fond du Lac, Wis., to accept management of the Eau Claire Cold Storage Corpn., Eau Claire Wis., recently organized to take over business of the Cold Storage Refrigerator Co., manufacturing domestic and commercial steel ice boxes and automatic refrigerator cabinets.

▲▲▲ OBITUARY ▲▲▲

RICHARD R. HARRIS, for a number of years prior to his retirement in 1927 general manager of sales for the Pittsburgh Steel Products Co., Pittsburgh, died at his home in Brantford, Ont., on Oct. 12. He was born in Canada 75 years ago, and was engaged in business there until 1896, when he went with the New Castle Tube Co., New Castle, Pa. When this company was taken over by the Shelby Tube Co. in 1898, he continued in its employ and later went with the National Tube Co., when it took over the Shelby organization in 1901. In 1906 Mr. Harris left the National company to become manager of sales of the Seamless Tube Co. of America, as the Pittsburgh Steel Products Co. then was known. He continued in this capacity until 1926, when he was made general manager of sales for the Pittsburgh Steel Co. and all of its subsidiaries.

R. R. HARRIS

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WALTER J. MITCHELL, formerly an iron and steel manufacturer of Cincinnati, died at his home in Manchester, Mass., Oct. 9, aged 81 years. He retired from business 30 years ago.

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JOHN BROCKENBROUGH NEWTON, president, Virginia Iron, Coal & Coke Co., Roanoke, Va., died in that city on Sept. 22, aged 63 years. Previous to his association with the Virginia company he was engaged in railroad work in the South. Mr. Newton was appointed general manager of the Virginia Iron Company in January, 1903, and in the summer of that year was made vice-president and general manager. He continued in that capacity until his elevation to the presidency in 1911.

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HARRY J. ROCKWOOD, for several years an engineer with the Worthington Pump & Machinery Corpn., died of heart disease at a hospital in Holyoke, Mass., Oct. 5. Mr. Rockwood's first connection with the company was at its East Cambridge, Mass., plant, but when that property was abandoned he was transferred to Holyoke.

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E. H. MAYTAG, president and treasurer of the Maytag Co., Newton, Iowa, and identified with the company for 32 years, died in a Newton hospital Oct. 6 as the result of injuries sustained in an automobile accident on Sept. 10. He was 67 years old.

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Sheet & Tube Merger Suit Postponed Again

Common Pleas Judge George H. Gessner of Youngstown has postponed until Nov. 12 the hearing on 22 suits brought by dissenting stockholders of the Youngstown Sheet & Tube Co. opposed to a merger of the company with the Bethlehem Steel Corpn. This is the eighth time the hearing of these actions has been postponed.

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Pennsylvania Engineering Absorbs Mead-Penn

The Pennsylvania Engineering Works, New Castle, Pa., engineer, contractor and builder of blast furnace and steel mill equipment, has acquired the Mead-Penn Iron Works Co., Meadville, Pa., and a new company has been formed, to be known as the Pennsylvania Engineering Corpn., with main offices at New Castle, Pa. The new corporation will have capital stock of 300,000 shares of no par value.

Officers of the new company are William H. Lewis, president; William S. Wheeler, first vice-president and general manager; Lee E. Allen, second vice-president and engineer; John E. Crawford, treasurer; Paul M. Pattison, secretary and assistant treasurer; Clark Rossiter, general superintendent.

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First Fall Meeting of New York Steel Treaters

At the first meeting of the season to be held by the New York chapter of the American Society for Steel Treating, Monday evening, Oct. 19, the speaker will be H. J. French, research metallurgist, International Nickel Co., New York, who will take as his subject, "Alloy Structural Steels" with special reference to those containing nickel, chromium, molybdenum and manganese. The meeting will be held in the assembly rooms of the Merchants Association of New York in the Woolworth Building.

Automobile Chamber and Scrap Institute May Cooperate in Junking Old Cars

plan for cooperation of the Nal Automobile Chamber of Comce and the Institute of Scrap Iron Steel in the scrapping of 3,000,old automobiles annually was dised at the semi-annual conference he institute in Pittsburgh on Oct. 14. it is proposed that the yards the members of the institute be n preference in conducting work this sort and a representative of chamber in attendance at the eting stated that the plan was ing favorably considered.

Members of the institute's railroad ap committee also met with a mmittee of the American Railway sociation to discuss changes in the classifications of railroad scrap designed to be of benefit to both the railroads and the scrap industry. A number of important revisions are expected to be developed as a result of this.

The research committee of the institute also reported on the work being carried on in the classification of alloy steel scrap, with a view toward placing this commodity on a sound marketable basis. It was pointed out that a number of mills are unable to use alloy scrap in the furnaces at this time, and that the rapid growth in the use of alloy steels is naturally leading to a much larger production of this commodity.

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Filing of Short-Haul Rates May Be Delayed

WASHINGTON, Oct. 13.—Railroads in Central Freight and Trunk Line territories have set Nov. 3 as the tentative date for filing with the Interstate Commerce Commission tariffs reducing rates on iron and steel products for hauls of 100 miles and less. The tariffs are to be filed on ten days' notice. Therefore, if the proposed date is definitely decided upon, the lowered rates would go into effect on Nov. 13.

It is doubted, however, that the tariffs can be filed on the suggested date. This is due first to the injunction carriers have obtained in court against an order of the Public Service Commission of Pennsylvania for application of reduced short-haul rates on iron and steel products from the Pittsburgh district. These rates now are in suspension. Pending the outcome of the injunction, the railroads cannot determine the rates they will apply. If the injunction is made permanent, it is understood that the rates to be applied will be somewhat higher than those provided in the Pennsylvania commission order. Should the short-haul rates out of Pittsburgh be resumed, however, on the scale that has been prevailing, the railroads will be compelled to establish other rates in the affected territories on a parity with the Pittsburgh rates in order to avoid discrimination.

Another factor that may delay filing of the schedule is the requirement of the Interstate Commerce Commission that the rates be made on a point-to-point basis instead of on a group basis. This means the filing of rates covering all producing points to points of destination and therefore will involve much more clerical work than would be required if the rates were made on a group basis. The fact that the carriers evidently consider the rates out of Pittsburgh too low indicate they propose to depart from the scale they originally filed and which was built on the scale applying out of Pittsburgh.

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International Organization of Structural Engineers

The International Association for Bridge and Structural Engineering, whose headquarters is in care of the Swiss Federal Institute of Technology, Zurich, Switzerland, has informed THE IRON AGE of progress made in the development of this organization. The association will represent all countries, each country having less than 50 memberships to be represented on the permanent committee of the organization by two delegates and two substitutes, and a country with more than 50 memberships four delegates and four substitutes. The aim is to have the two modes of construction, steel and reinforced concrete, represented in equal numbers if possible. The minimum annual subscription for individual members amounts to 10 Swiss francs, and for collective members 50 Swiss francs.

The executive committee of the association consists of:

President, Prof. Dr. A. Rohn, president of the Swiss Educational Board, Switzerland.

Vice-presidents: Sir Thomas Hudson Beare, Great Britain; Dr. Ing.e.h. M. Klönne, Germany; Prof. E. Pigeaud, France.

General secretaries: Prof. Dr. L. Karner, Switzerland, for steel construction; Prof. Dr. M. Ritter, Switzerland, for reinforced concrete construction.

Technical advisers: Dr. F. Bleich, Austria, and Prof. T. Godard, France, for steel construction; Prof. F. Campus, Belgium, and Dr. Ing. W. Petry, Germany, for reinforced concrete construction.

Secretary: Dipl. Ing. P. E. Soutter, Switzerland.

Plans are being made for the Paris congress, which takes place May 19 to 24, 1932. Among the subjects to be dealt with are: Stability and strength of structural members subjected to compression and bending; slabs in reinforced concrete structures; welding in steel structural work; large girder bridges in reinforced concrete; dynamics of bridges; development of the statics of reinforced concrete with regard to the properties of the material used; girders in conjunction with concrete; research concerning building ground.

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Pratt & Whitney Buys Keller Company

Purchase of the Keller Mechanical Engineering Corpn., 70 Washington Street, Brooklyn, by the Pratt & Whitney Co., Hartford, Conn., has been announced by Clayton R. Burt, president and general manager of the latter company. The Pratt & Whitney Co. assumed the management of the Keller business on Oct. 1. Operations will be continued in the present Keller plant in Brooklyn until some time in November, when all machinery, tools, fixtures, patterns, etc., will be moved to Hartford. Buildings formerly occupied by the Pratt & Whitney Aircraft Co. will be utilized for the manufacture of the Keller machines.

The Keller company has employed between 200 and 300 men. Its products consist principally of automatic die sinking and tool room machinery and other miscellaneous tools.

Alexander S. Keller has been appointed manager of the Keller division of the Pratt & Whitney Co., and will take up his residence in Hartford in the near future. Joseph F. Keller, one of the founders of the business, will be associated with the business in an advisory capacity.

Mr. Burt announced that it is the intention to remove to Hartford a great many of the executives and workmen who have had many years' experience in the manufacture of Keller machines.

The Keller Mechanical Engineering Corpn. was started as a small job shop in May, 1896, by Sidney A. and Joseph F. Keller, whose work in the early days was confined principally to making dies and small tools for silversmiths and jewelers. The invention and perfection of the Keller duplicating machine was the nucleus for expansion and progress, and the history of the Keller company has been one of steady growth ever since. The electric controls first developed to increase the scope of Keller die sinking machines are now used widely to control automatically the movements of a great variety of other machine tools. The Keller company has been an important factor in the development of many industries, particularly those requiring dies in the evolution of their products.

W. W. MACON
Editor

THE IRON AGE

A. I. FINDLEY
Editor Emeritus

(ESTABLISHED 1855)

Checking Deflation

THE organization of a huge pool to thaw out frozen credits focuses attention anew upon our credit mechanism. The credit system provides a bookkeeping method by which goods and services are exchanged without actual transfer of currency. It provides the means for carrying on most of the business of the country. It limits the use of currency mainly to wage payments and family expenditures.

While recognized as indispensable, the credit system has introduced variables into the business structure that would not be present if currency were the sole medium of exchange. In fact, Dr. Willford I. King, whose article appears elsewhere in this issue, declares that business cycles as we now know them did not exist before the development of credit machinery.

The use of credit greatly accentuates both inflation and deflation. During a period of rising prices the amount and turnover of credit increase, thereby adding to the momentum of the upward price swing. During a time of price decline, the amount and turnover of credit decrease, giving added force to the downswing of prices. When finally confidence is seriously disturbed and deposits are withdrawn from banks, the credit base is further reduced and prices are driven to new lows.

Eventually deflation will complete its course, but in the meantime irreparable damage can be done. It was because of a realization of the consequences of unrestrained deflation that the President called together leading bankers last week to devise a remedy. The credit corporation that was formed is now criticised by ardent deflationists as an "artificial contrivance" which will only delay and hamper business recovery. This line of argument is not convincing, for as a matter of fact the whole credit system is an artificial contrivance and it is in the public interest to alter it so that it operates with the least disturbance to business.

It is difficult to see why extreme deflation should have any more merit than extreme inflation. Both are the outcome of exaggerated swings that grow out of the very nature of the credit system. Both are injurious to business and the public at large. Machinery to check both was provided in our Federal Reserve act.

The formation of the bankers' pool was an emergency move to stop hoarding. The recommendation of Dr. King is more far-reaching, since it calls for more vigorous use of Federal Reserve machinery to the end that the price trend may be turned upward. While the gold reserves of the Federal Reserve Banks have been reduced nearly half a billion dollars by foreign withdrawals since the middle of September, they are still far above the legal minimum. Moreover, the restoration of confidence, if once achieved, will return to the credit system close to a billion dollars of hoarded money and this vast sum will be equivalent in its effects to a huge importation of gold.

Deflationists tell us that depression must be allowed to work its own cure. Industry realizes that a depression of great severity often kills before it cures. Industry is keenly interested in finding ways of preventing this wasteful destruction. Whether the King formula wins favor or some other approach to the problem commends itself to business, it is certain that the demand for stable credit will become as strong as the demand for sound money was in the 90's.

Dollars, Pounds and Trade

PROBLEMS produced by the depreciation of the Canadian dollar are particularly difficult, for an appraisal of where things will land is impossible. No one knows where the pound sterling will find itself eventually and in addition no one knows how the Canadian dollar will adjust itself in proportion, i. e., how much influence the American dollar will have in holding it up and how much influence the pound will have in pulling it down. On the first break the Canadian dollar went off two-thirds as much as the pound sterling, but since then the relationship has been climbing until last week it crossed the half-way point, the Canadian dollar closing at less than half as much depreciation as the pound, in a period when both were advancing.

As soon as the drop began, Canadian customers asked our sellers to accept Canadian dollars and that was, of course, promptly refused, our sellers feeling that prices had fallen plenty already. The Canadian Government came to our aid, in a way, by ruling as of Oct. 1 that the anti-dumping provision would be applied if possible to such concessions, although in essence if an American seller made the concession the Canadian Government, not the customer, would get it.

The business world wants to know how the matter will work out, but it will work out the way the flow of trade makes it work out. Suppose, for instance, assuming figures which approximate the actuality in the latter part of last week, the pound sterling is at $3.90 and the Canadian dollar at 90 cents, then the former is off 20 per cent and the latter 10 per cent. With no change in market prices in either of the three countries, the Canadian course would be to buy more than formerly from England and less from the United States, but to sell less to England and sell more to the United States.

Of course, there is a great deal of trade that will not be materially affected, for example, in goods which Canada must have from us because they cannot be had from England and in those products which would not be cheap enough if bought from Great Britain, even with the difference in exchange. One of the present

problems is the difficulty of measuring how easy or difficult it would be for any given class of trade to be dislodged.

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Rail Tonnage and Traffic

THE annual statistical summary of certain railroad operations in 1930, just issued, which includes data as to rails laid, is quite timely, as the annual rail buying movement is at hand. There has always been more or less relationship between the volume of freight traffic and the quantity of rails laid, both because traffic earnings encourage railroads to buy and because in course of time the traffic wears out rails.

In the last 11 years for which data are available, the railroads have laid one gross ton of new steel rails against an annual traffic of a little less than 250,000 net ton-miles, revenue and non-revenue freight. The reference is to Class I roads—those having annual operating revenues exceeding $1,000,000—and excludes switching and terminal companies.

For these roads the table shows thousands of net ton-miles of freight moved, including company freight, second-hand rails laid, new rails laid and a factor computed by dividing the freight movement into the new rails laid. The factor is, of course, merely conventional, to show the variation. The general average of the factor, for 11 years, is 405. When for a given year the factor exceeds 405 it means that the railroads laid more rails than usual relative to the freight traffic they had, and vice versa.

Rails Laid Relative to Traffic (Class I Roads)

	Net Ton-Miles Freight, Including Non-revenue (millions)	Second-hand Rails Laid, Gross Tons	New Rails Laid, Gross Tons	New Rails Divided by Traffic
1920	447,278	1,095,352	1,411,609	316
1921	340,862	1,124,119	1,464,194	430
1922	371,946	1,228,276	1,390,290	374
1923	456,238	1,409,276	1,729,696	379
1924	426,834	1,393,374	1,791,162	420
1925	452,819	1,534,495	1,950,146	430
1926	486,265	1,608,254	2,209,873	455
1927	471,793	1,694,350	2,124,765	450
1928	473,774	1,725,374	2,080,277	439
1929	489,887	1,651,966	1,958,489	400
1930	420,016	1,156,672	1,517,002	361

The factor has shown a general tendency to move upward, averaging 10 per cent higher in the last five years than in the first five years covered. The increase may be ascribed entirely to heavier rails being laid, the mileage replaced having in all probability decreased materially. As the roads lay more durable rails from year to year, the mileage to be later replaced decreases.

In a general way, when traffic was heaviest replacements were heavier still, not because correspondingly more track became unserviceable, but because the railroads felt more prosperous.

As traffic is now running, there would be in the neighborhood of 350,000,000,000 to 375,000,000,000 ton-miles next year. According to the average factor, this would mean 1,450,000 to 1,500,000 tons of new rails.

Reforming the Calendar

ADVOCATES of a change in the calendar, whereby we shall have 13 months of 28 days each, with, each year, either one or two days not in any month or in any week, are ardent and periodically active. They point out that 1000 business firms in the United States alone are using the four-week period as the basis for their business accounting. They argue, of course, that comparisons of one month with another and one period with another will be greatly facilitated by the proposed change.

It happens that there are nearly 200,000 manufacturing establishments in the United States. There are also at least as many trading establishments, large and small, not to mention thousands of financial and other business institutions of various kinds. Establishments using records of past performance for guidance in the present and future may number as many as half a million. Thus, for each concern using the advocated system there are perhaps 500 who do not.

It is perfectly legal, perfectly permissible, for any concern to use the four-week accounting period if it so desires. (Even that period will not even up the incidence of holidays or other days on which business conditions are not uniform.) There is a certain insistence of the proponents that is analogous to the attempts of the metric enthusiasts to force compulsory use of a unit which does not commend itself from the engineering or business standpoint to the minds of the great majority.

Some years ago this department of THE IRON AGE suggested that about nine-tenths of the trouble from unevenness in the calendar could be avoided by a very simple expedient: Add two days to February by taking one from January and one from March. Then all months would be either 30 or 31 days (February being 31 days in leap year), and results of comparisons would be close enough for all practical purposes.

This would still leave the year divisible readily into halves and quarters, and business men do not need to be reminded that halves and quarters are the periods with which we are very largely concerned in financial reports and other matters.

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▲▲▲ CORRESPONDENCE ▲▲▲

Favors Laissez Faire Policy

To the Editor:

Your leading editorial in the Oct. 1 issue of THE IRON AGE with respect to "Stabilizing Credit" suggests a policy of credit inflation as a means of accelerating a return to more normal business conditions. Although your theory is accepted in many eminent quarters, there are nevertheless strong arguments that counsel against the adoption of such a policy. First and foremost, a theory of credit inflation fails to recognize the fundamental purposes of credit.

Credit is at bottom merely a means of satisfying, in the present, wants which without its benefit would have to be deferred into the future. In providing a means for the immediate satisfaction of our wants, credit becomes an element in production and the services of distribution. In forwarding the processes of production and distribution, credit is transformed into the values of the

producers and consumers' goods and services which it has created. If the credit used in creating new goods results in overstocking the world's markets, values will of course fall. In addition, the use of credit, of course, presupposes the origination of a debt counterbalancing the creation of new goods. Such debts are, of course, originated with a thought that the values they create will either rise or at least be static. Obviously, however, if the extension of credit results in a surfeited market and values fall, then the debt created will be the more difficult of extinction as its satisfaction will require the payment of dollars of an enhanced purchasing power. Creditors gain—debtors lose, and the processes of deflation set in.

Due to improved technological processes, the resumption of production in the former war-torn area, the competition of Russia, the increase of new plant capacity for manufacture, and the breaking of new areas for agriculture, the world's production capacity has vastly increased over the past decade—in fact, to the point that supplies of and the ability to supply almost all primary goods exceed the world's capacity to consume at fair prices.

If this theory of a condition of oversupply is to be accepted and if credit is to be recognized as one of the elements in the chain of production, there is but little doubt that the further extension of credit would merely accentuate an existing condition of oversupply thereby driving values still lower and setting up debts which will be increasingly difficult to liquidate in any orderly manner.

A laissez faire policy implies a policy of permitting deflation to run its course and by and large is probably a correct policy, for deflation is an economic disease whose early stages are discernible as inflation. Inflation in its outset is preventable through sound and conservative business thought, but if not checked in its early stages is incurable except through the rigorous treatment of deflation. Credit, if applied as a poultice to deflation, is irritating rather than healing. The free working of the law of supply and demand toward eventual equilibrium is the only normal solution of our present difficulties.

As regards England, it is probably correct to assume that she erred originally in stabilizing the pound sterling at its pre-war value. England's difficulties are not, however, the entire result of mistaken monetary policy, for it must be remembered that formidable competitors have developed for many of her markets, particularly India and the Orient. It is reasonable to suppose that such a competitor as Japan can hold permanently the markets she has won from England in recent years by virtue of her geographical advantages and regardless of any past or future monetary policy on England's part.

A. L. MILLS, JR.
Portland, Ore. First National Bank of Portland.

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How a Jobbing Plant Keeps Costs

(*Concluded from page* 999)

tion is keen, that a larger proportion of burden will be absorbed, with the result that costs and selling prices are higher. This is reversed when conditions are above normal, as less burden will be absorbed and costs and selling prices will be lower, at a time when trade conditions will stand for higher than average prices. Absorption of burden should be based on the average of all conditions permitting

Fig. 8—Showing Results of Over or Under Absorbed Burden
(In Dollars)

	Normal	20% Over Normal	20% Below Normal	40% Below Normal
Sales	800,000.00	960,000.00	640,000.00	480,000.00
Costs: Labor and Material	580,000.00	696,000.00	464,000.00	348,000.00
Burden: Manufacturing and Commercial	160,000.00	192,000.00	128,000.00	96,000.00
Total cost	740,000.00	888,000.00	592,000.00	444,000.00
Profit: (Shown by cost sheets)	60,000.00	72,000.00	48,000.00	36,000.00
Over or under* Absorbed Burden	0	16,000.00	16,000.00*	32,000.00*
Operating profit	60,000.00	88,000.00	32,000.00	4,000.00
Deductions: Income, taxes and contingencies	20,000.00	22,000.00	18,000.00	16,000.00
Net profit—*Loss*	40,000.00	66,000.00	14,000.00	*12,000.00

Italic face used to represent red ink figures.

the sales executive to exercise judgment of what sales prices should be.

If business is greatly subnormal and the management should take business below their current costs to keep their plants going at the competitors' expense, the aggregate of their profits shown by the cost sheets will be greatly below the profits shown in columns three and four. The net profit would be greatly reduced.

The "volume minded" management usually disregards the fact that competitors have an equal right to their percentage of the business and also disregards that the idle plant capacity of competitors is a menace to its business and to the entire industry.

The "profit minded" management, giving the greatest consideration to "cost plus profit," will make the best earning record in subnormal as well as normal periods.

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The Motorization of Modern Grinders

(*Concluded from page* 991)

from coming in contact with live parts, since some of the motors are quite close to his working position. In some cases additional protection may be required to prevent coolant or sludge splashing on the motors, but as a rule they are so located that they are in no danger.

Centerless Grinders

Though centerless grinders, insofar as the work they produce is concerned, belong to the cylindrical groups, yet their design is quite different in that they have no reciprocating work table, and no work-rotating mechanism. The rotation of the work is accomplished by means of the grinding wheel and the regulating wheel, between which the work passes. The driving motor is located at the side or back of the machine base and should preferably be of fan-cooled construction to protect it from cutting compound and dirt.

One very important consideration of grinding is that of correct cutting speed. As the wheel wears down its speed should theoretically be increased to maintain the most efficient cutting speed. In some types of floor or swing-frame grinders, this is accomplished by the use of direct-current motors, having a rheostat in the field circuit for increasing the speed.

As the wheel wears and the wheel guard is moved in, it automatically changes the setting of the rheostat through a mechanical connection.

Speed-Steps in Grinder Batteries

If a battery of machines is in use, it is good practice to have different speeds on different machines. Hence, as a wheel wears down it can be transferred to a higher speed machine, thus increasing its cutting speed to its former value.

One objection to mounting motors directly on the spindle when a. c. motors are used is that no speed change is possible. Where rough work is being done, this is not so important, and floor grinders usually have the motors on the spindles. In the case of surface grinders of the Blanchard type, and face grinders where the end of the wheel is used, the wheel wear does not affect the cutting speed and spindle mounting can be employed. In such applications thrust bearings are a necessity to take up the end thrust encountered. Where the motors are belted to the spindle, it is necessary to change pulleys or sheaves to change the speed. In a few designs special provision is made to simplify this changing. Direct-current motors, with field control, are capable of operating over a wide range of speeds, but direct current is not always available. Also precautions must be observed to be sure that a new wheel is not started up with the motor field rheostat set for full speed, as in such a case the safe operating limits of the wheel may be exceeded. Large roll grinders are usually provided with adjustable speed d. c. motors for the wheel drive as well as the work drive. Smaller machines, as mentioned previously, invariably have an adjustable speed d. c. work drive motor, even if it is necessary to include a small generator with the machine for supplying the necessary power.

Be Careful About Reversing Wheel Rotation

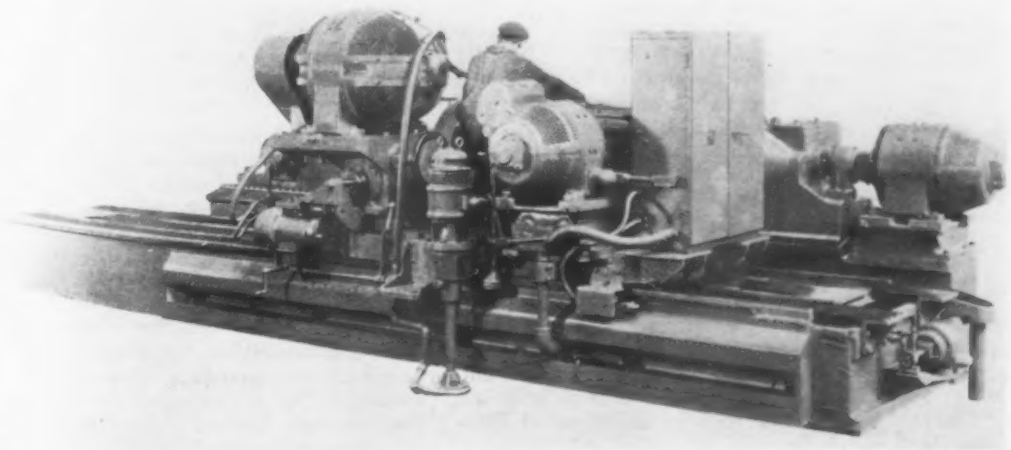
As a rule, grinding wheels are arranged to run in one direction only. With electric motor drive it is a very simple matter to reverse the direction. However, before doing so the construction of the grinding wheel spindle should be checked. The design of floor and bench grinders is usually such that the nut used for holding the wheel tends to tighten with normal rotation. If such a spindle is reversed, there would be a tendency for the nut to loosen and allow the wheel to come off. If, therefore, it is desired to reverse the rotation, a new spindle should be provided which would eliminate the possibility of the wheel coming loose. Wheels held by studs or bolts and nuts rather than by a nut on a threaded spindle are less likely to give trouble from this source, but since they are in the minority, it is a safe rule to say that electric grinders should not be reversed.

Another important consideration in motors for grinders, especially those for precision work, is that of balance. It is evident from the character of the work to be done that any vibration would be detrimental to the accuracy of the machine. Hence, all motors for such machines must be dynamically balanced. However, balancing the motor only does not clear up the situation. The wheel spindle must also run true. Then when the wheel itself is put on additional chances of out of balance are introduced. The wheel may be absolutely balanced at the start and as homogeneous as it is possible for the manufacturer to make it. As it wears down, particles come off, which may have a tendency to throw it out of balance. If wet grinding is done and the wheel should be permitted to stand partially submerged over night, it will be unbalanced, due to the absorption of water.

Dynamic Spindle and Rotor Balancing

A balancing machine has recently been made available which enables motor rotors or machine spindles to be balanced to a very high degree of accuracy in a fraction of the time formerly required for such work. In fact, by applying the principles of this machine to the construction of the grinder, it is possible to arrange it so that the whole spindle, including the wheel, can be balanced daily if desired. A very special mechanical layout of the spindle is necessary, which will permit the spindle to be temporarily released and free to vibrate. In many cases, the added accuracy of work may more than justify the expense of such construction.

In general, then, in selecting motors for grinders consideration should be given to proper working speed; suitable protection to the motor windings and bearings; and accuracy of balance. These three are the chief considerations, although individual special applications may require other modifications.



SIX of seven motors used for the various functions on a large roll grinder.

Business Revival Hoped for as Result of Credit Plans

Moves Initiated by President Hoover Expected to Hasten Restoration of Activity

WASHINGTON, Oct. 13.—Early and healthy revival of business is being hoped for from the moves instituted by President Hoover to improve the credit structure of the nation. The plans have been hailed generally with strong approval. While some predictions as to their beneficial results are held to be excessive, the dominating view is that the proposals are sound and of such great magnitude th. t much will be accomplished in the way of restoring business activity that will be reflected not only in the United States but in the rest of the world.

The quickest stimulus naturally is looked for from the setting up of the National Credit Corpn. of New York City, incorporated at Dover, Del., last week, with a pool of $500,000,000, to be subscribed by clearing house associations throughout the country. There are 391 such associations. Organization of the corporation has been practically completed and it will be in operation in a few days. The chief purpose of this bankers' fund is to thaw out frozen credits and turn them into liquidity for immediate flow into the channels of trade. Total frozen credits of the country are estimated at some $4,000,000,000. The total resources of the subscribing banks is placed at about $42,000,000,000.

Other plans embraced in the plans made by President Hoover at the White House conference on Tuesday night of last week with 32 members of Congress and Treasury officials are:

> Governors of 12 Federal Reserve banks urged to make advances on security of assets of closed banks, or to take over some of these assets so receivers of the banks may make immediate payment of some of their dividends to depositors instead of waiting for liquidation. A similar appeal was made originally by the President on Sept. 8 and several Federal Reserve districts have already made considerable progress to this end.
>
> Governors of each Federal Reserve district requested to appoint a working committee to cooperate with the New York group in carrying out the program of "unification and solidarity."

Further Recommendations to Be Made

The President will recommend to Congress that the eligibility provisions of the Federal Reserve act be broadened so as to give greater liquidity to assets of banks. The purpose is to enable bankers to obtain legitimate accommodations on sound security in times of stress in granting credits. Measures of this kind are now under consideration by the Senate Committee on Banking and Currency. It is reported that a sub-committee of the committee will meet in mid-November to hold hearings on the subject.

If necessary, the President will recommend the creation of a Government finance corporation similar to the former War Finance Corpn., with funds sufficient to meet legitimate credit demands.

The President will also recommend to Congress the strengthening of resources of Federal Land banks through the subscription of further capital stock. The purpose is to assure farmers required credits at low rates of interest.

The President announced that the program has been approved "in principle" by the delegation from Congress, made up of 11 Republicans and seven Democratic Senators, and nine Republican and six Democratic Representatives. Others attending the conference were Secretary of the Treasury Mellon, Under Secretary Mills and Governor Meyer of the Federal Reserve System.

The qualifying term that the plan had been approved "in principle" was due to the fact that some members of the Congressional delegation expressed belief that certain features when detailed might require modification. Some of them also made clear their distinct opposition to any plan the administration may have for further extension of time in paying war debts. This latter attitude was made known when the President said he will discuss with Premier Laval of France "such further arrangements as are imperative during the period of depression regarding intergovernmental debts."

To Strengthen Bond Prices

In addition to these proposals, the administration is said to have started a comprehensive study looking to the strengthening of railroad and industrial bonds, which would require further broadening of the Federal Reserve Act. It is this and other legislative requirements around which differences have already developed, with the result that highly optimistic results prophesied for the administration plans are felt in some quarters to have been over-emphasized. The fact remains, however, that the principles have been accepted by a large number of prominent bi-partisan members of Congress with the intention of enacting them into law.

While it is desired to carry out legislation as soon as possible, Congress probably will not convene until December, since an extra session seems unlikely. It will take some time to complete the legislation.

It is clear therefore that the initial steps toward restoring confidence and business, by liquefying frozen assets and returning some $800,000,000 to $1,000,000,000 hoarded currency to commercial activities, rest with private bankers of the country through the credit corporation.

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General Electric Plans to Guarantee Work

Affirming its confidence in the future of the electrical industry, the General Electric Co., through President Gerard Swope, has offered its shop employees a plan which would virtually guarantee them six months' employment beginning Nov. 1. The proposal, which is called "a plan to prevent further layoffs for lack of work," is to be voted on by employees of the company who are members of the General Electric unemployment pension plan, which embraces the great majority of all shop employees of the company.

Approximately $1,000,000 has already been distributed to General Electric unemployed during the 10 months since Dec. 1, 1930, when the emergency payments under the unemployment plan were started. Half of this was contributed by the employees working half time or more and the other half by the General Electric Co.

"We are firmly of the belief," said President Swope in announcing the new proposition to the workers, "that the electrical needs of 125,000,000 people in the United States, especially with the increasing demand in the home, will keep the electrical industry active. We realize the anxiety in the minds of our hourly and piecework employees in the apparatus works, which necessarily reduces their effectiveness and restricts their output, and to relieve this we offer for adoption by them this program, which we confidently believe we can carry out."

The plan, as described by President Swope, is "to so divide the work that there will be no further layoffs for lack of work between Nov. 1, 1931, and April 30, 1932, without compensation; and that all those on the payroll Nov. 1, 1931, will receive during this period not less than the equivalent of one-half of their average weekly earnings for full time, but in no case more than an average of $15 a week. If actual earnings are above that average, however, the employee is to receive his actual earnings.

Automobile, Railroad and Farm Equipment Steel Orders Gain Slightly

THOUGH Ingot Rate is No Higher, Finishing Mill Operations Are Stepped Up—Pig Iron Production Declines

MODERATE improvement in the demand for steel from the automobile, farm equipment and radio industries and the railroads, together with the better sentiment resulting from the efforts of the administration at Washington to mobilize the credit resources of the country, presents a somewhat brighter business picture.

Although increases in business are still spotty and not sufficiently large to lift steel ingot production above the 29 per cent rate of a week ago, the operations of finishing mills in some lines are higher than those of recent weeks, and further acceleration is promised for the latter half of October.

MOTOR car manufacturers have bought less steel during the week than was expected, but have released a good many contracts for parts, and further steel orders are certain to develop before the end of the month to insure deliveries for the production of new models, which is slated to begin in many automobile plants on Nov. 2.

Farm equipment manufacturers are increasing their orders and inquiries for steel for new production schedules, which in some instances will be begun early in November. The railroads, though slow with their annual rail inquiries and quiescent in plans for new rolling stock, are placing more liberal orders for steel for car repairs. The radio industry, while not a large tonnage user of steel, is expanding its steel requirements for seasonal manufacturing programs.

RAILROAD purchases of steel for car roofing and other repairs indicate enlarged shop operations. Inquiries for rails and rolling stock are undoubtedly being held in abeyance in many cases until the railroad rate decision and plans of the administration for financial aid for the carriers are known. Meanwhile, the Erie has come into the market for 35,000 tons of rails and the Louisville & Nashville for 20,000 tons.

Some tin plate contracts have been signed since the new price of $4.75 a base box was announced, and, though can companies will not require shipments before January or February, mills may anticipate these requirements by rollings during the remainder of the year.

PIPE orders are being worked off, and new business may not come in time to prevent a decline in operations. Structural steel has slumped this month. Bookings of the past week were only 11,500 tons, and new projects barely 10,000 tons. Business in plates is also exceedingly dull, one factor being the small purchases of the oil industry.

Operations of open-hearth furnaces and mills have increased at Cleveland and in the Valleys, but have declined quite sharply at Chicago. While some companies are running at 30 to 35 per cent of ingot capacity, others are doing much less, and one good-sized independent is below 20 per cent this week. Pig iron production may be lower this month, a merchant furnace having been blown out in the Chicago district, and there has been a loss of two stacks in Alabama.

Though prices of most steel products remain fairly firm, pig iron is weak in some districts, and scrap has had further declines at St. Louis and Cincinnati. At Pittsburgh, Chicago and in eastern Pennsylvania the scrap market is dull but steady.

A GENERAL broadening of business activity and returning confidence in Great Britain, coupled with some recession in output of iron and steel in France, Upper Silesia and Luxemburg, are now noticeable effects of the British abandonment of the gold standard, according to cable dispatches to THE IRON AGE. Welsh tin plate is enjoying a more active demand, both domestic and foreign, and tin plate bar makers are more heavily sold than in years. British export business is somewhat difficult, owing to new tariff barriers raised by certain countries and the rapid fluctuations of sterling exchange.

THE IRON AGE composite prices for pig iron and finished steel are unchanged at $15.34 a gross ton for the former and 2.116c. a lb. for the latter.

PITTSBURGH

Improved Sentiment Is Accompanied By Some Upturn in Orders

▲ ▲ ▲

Many important consumers showing more interest in steel purchases.

* * *

Some automobile business placed, and further orders are expected within a few days.

* * *

Railroads, farm equipment companies and radio makers increase their orders.

* * *

Ingot output has not gained, but some finishing mills have better schedules.

* * *

Pig iron weak. Scrap dull and unchanged in price.

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PITTSBURGH, Oct. 13.—While improvement in sentiment in the iron and steel trade during the last week has not led to any noticeable increase in releases for finished steel products, many important consumers are showing more interest in their forward purchases and orders are beginning to show an upturn. Automobile buying during the last week was not substantial, but enough business was placed to indicate an upward trend in production by some of the larger motor car companies and additional buying is expected in the next few days. Releases for much of this steel have been promised in the latter half of the month, and shipments during November will probably be even greater. This tonnage will affect makers of sheets, strip steel, alloy and cold-finished bars and also manufacturers' wire.

Second only to the automobile industry in importance is added activity on the part of the railroads. Inquiries for rails and accessories are beginning to come out, and car repairs during the winter promise to take increasing tonnages of steel. Makers of car roofing in particular have assurance of heavier schedules and are already placing orders for sheets. Buying of new rolling stock by the carriers is not so definitely assured and may depend to some extent on the outcome of the railroads' request for rate increases.

Agricultural implement makers served by Pittsburgh and nearby mills are at last beginning to increase their schedules slightly, and there has been a great improvement in demand for steel products from the radio industry. While this movement is seasonal to some extent, it represents the first significant buying from this source in a long while. The general run of miscellaneous consumers of steel continue to take tonnage at about the recent rate, and no further curtailment seems likely.

Steel ingot production in the Pittsburgh district continues at about 26 per cent of capacity, with the Valleys at about 28 per cent, and the Wheeling district at close to 40. However, finishing mill activity has been stepped up slightly in some cases, and ingot production may be expected to feel this impetus in the next week or two.

Finished steel prices are holding and have been more fully tested on sheets and strip steel.

PIG IRON

Shipments are showing a little improvement over those of September, but there is no new buying except in small lots for immediate shipment. Prices are admittedly weak, but local makers are not disposed to make a formal reduction. Competition with Lake Erie furnaces is responsible for most of the price concessions available. Official prices are unchanged at the figures quoted below.

Prices per gross ton, f.o.b. Valley furnace:

Basic	$15.50 to $16.00
Bessemer	17.00
Gray forge	16.50
No. 2 foundry	17.00
No. 3 foundry	16.50
Malleable	17.00
Low phos., copper free	26.66 to 27.00

Freight rate to Pittsburgh or Cleveland district, $1.76.

Prices per gross ton, f.o.b. Pittsburgh district furnace:

Basic	$16.00 to $16.50
No. 2 foundry	17.50
No. 3 foundry	17.00
Malleable	17.50
Bessemer	17.50

Freight rates to points in Pittsburgh district range from 63c. to $1.13.

SEMI-FINISHED STEEL

Shipments are somewhat heavier than they were last month, with some producers, but are not much higher in the aggregate. Non-integrated makers of sheets, strip and tin plate are operating on very low schedules. No test of the market is being made by current tonnage, with quotations on billets, slabs and sheet bars nominal at $29 a ton. Forging billets are holding at $35. Wire rods are dull, but no change in price is indicated.

RAILS AND TRACK ACCESSORIES

The Erie Railroad is in the market for 35,000 tons of rails. No new inquiry for accessories is reported, but the Chesapeake & Ohio is soon expected to take action on track supplies required for its recent rail order. Light rails are very quiet, with the price unchanged at $34 a ton, Pittsburgh.

BOLTS, NUTS AND RIVETS

No improvement in releases is noticeable, and prices on bolts and nuts continue very unsatisfactory. While a few large makers are still adhering to discounts of 73 and 10 per cent off list, many jobbers are able to secure an additional 10 per cent. Large rivets are holding at the recently adjusted price of $2.25 a 100 lb., while small rivets are rather well maintained at 70, 10 and 5 per cent off list.

BARS, PLATES AND SHAPES

A little tonnage in merchant and alloy steel bars has been placed by automobile and parts makers in the last week, but specifications against these orders are not yet being entered. Otherwise the market shows little signs of life, although some heavy reinforcing bar jobs are still being placed. The Department of Commerce Building at Washington took 2600 tons of rail steel, while 2550 tons of reinforcing bars has been ordered for a sewer at Louisville. Shipments against reinforcing and structural steel awards placed earlier in the year are keeping up at a fair rate, but the volume of new orders is declining. Structural capacity is engaged at about 35 per cent of theoretical full, while the average in bar and plate mills is not as high. Prices on the heavy hot-rolled products are being maintained, except on large tonnage projects, on which price concessions are obtainable.

COLD FINISHED STEEL BARS

While no improvement in releases is reported, new buying is still fairly active and future prospects are somewhat better than they have been. The 2.10c., Pittsburgh, price is generally adhered to.

TUBULAR GOODS

While two tentative inquiries for line pipe have come before the trade recently, there is no certainty that this business will reach mills this year. The Continental Construction Corpn. expects to extend its present gas line from a point in Illinois to Milwaukee, requiring 170 miles of 20-in. pipe. The Sun Oil Co. is also said to be considering an extension of its gasoline carrying line into New York State, and may buy about 5000 tons of 10-in. pipe. Otherwise the market

A Comparison of Prices

Market Prices at Date, and One Week, One Month and One Year Previous, Advances Over Past Week in Heavy Type, Declines in Italics

Pig Iron, Per Gross Ton:	Oct. 13, 1931	Oct. 6, 1931	Sept. 15, 1931	Oct. 14, 1930
No. 2 fdy., Philadelphia	$16.26	$16.26	$16.26	$18.76
No. 2, Valley furnace	17.00	17.00	17.00	17.00
No. 2 Southern, Cincinnati	14.69	14.69	14.69	15.19
No. 2, Birmingham	12.00	12.00	12.00	14.00
No. 2 foundry, Chicago*	17.00	17.00	17.50	17.50
Basic, del'd eastern Pa.	16.75	16.75	16.75	17.75
Basic, Valley furnace	15.50	15.50	15.50	17.00
Valley Bessemer, del'd P'gh	18.76	18.76	18.76	19.76
Malleable, Chicago*	17.00	17.00	17.50	17.50
Malleable, Valley	17.00	17.00	17.00	18.00
L. S. charcoal, Chicago	25.04	25.04	25.04	27.04
Ferromanganese, seab'd carlots	†85.00	†85.00	†85.00	94.00

*The average switching charge for delivery to foundries in Chicago district is 61c. per ton.
†Ferromanganese quotations adjusted to carlond unit; larger quities at discount.

Rails, Billets, etc., Per Gross Ton:				
Rails, heavy, at mill	$43.00	$43.00	$43.00	$43.00
Light rails at mill	34.00	34.00	34.00	36.00
Rerolling billets, Pittsburgh	29.00	29.00	29.00	31.00
Sheet bars, Pittsburgh	29.00	29.00	29.00	31.00
Slabs, Pittsburgh	29.00	29.00	29.00	31.00
Forging billets, Pittsburgh	35.00	35.00	35.00	36.00
Wire rods, Pittsburgh	35.00	35.00	35.00	36.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.	1.60	1.60	1.60	1.60

Finished Steel, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Bars, Pittsburgh	1.60	1.60	1.60	1.60
Bars, Chicago	1.70	1.70	1.70	1.70
Bars, Cleveland	1.65	1.65	1.65	1.65
Bars, New York	1.93	1.93	1.93	1.93
Tank plates, Pittsburgh	1.60	1.60	1.60	1.60
Tank plates, Chicago	1.70	1.70	1.70	1.70
Tank plates, New York	1.88	1.88	1.88	1.88
Structural shapes, Pittsburgh	1.60	1.60	1.60	1.60
Structural shapes, Chicago	1.70	1.70	1.70	1.70
Structural shapes, New York	1.85½	1.85½	1.85½	1.85½
Cold-finished bars, Pittsburgh	2.10	2.10	2.10	2.10
Hot-rolled strips, Pittsburgh	1.55	1.55	1.55	1.60
Cold-rolled strips, Pittsburgh	2.15	2.15	2.15	2.35

Finished Steel, *Per Lb. to Large Buyers:*	Oct. 13, 1931 Cents	Oct. 6, 1931 Cents	Sept. 15, 1931 Cents	Oct. 14, 1930 Cents
Hot-rolled annealed sheets, No. 24, Pittsburgh	2.40	2.40	2.40	2.35
Hot-rolled annealed sheets, No. 24, Chicago dist. mill	2.50	2.50	2.50	2.55
Sheets, galv., No. 24, P'gh	2.90	2.90	2.90	3.00
Sheets, galv., No. 24, Chicago dist. mill	3.00	3.00	3.00	3.10
Hot-rolled sheets, No. 10, P'gh	1.70	1.70	1.70	...
Hot-rolled sheets, No. 10, Chicago dist. mill	1.80	1.80	1.80	...
Wire nails, Pittsburgh	1.90	1.90	1.90	2.00
Wire nails, Chicago dist. mill	1.95	1.95	1.95	2.05
Plain wire, Pittsburgh	2.20	2.20	2.20	2.30
Plain wire, Chicago dist. mill	2.25	2.25	2.25	2.35
Barbed wire, galv., Pittsburgh	2.55	2.55	2.55	2.70
Barbed wire, galv., Chicago dist. mill	2.60	2.60	2.60	2.85
Tin plate, 100-lb. box, P'gh	$4.75	$4.75	$5.00	$5.00

Old Material, Per Gross Ton:				
Heavy melting steel, P'gh	$10.25	$10.25	$10.75	$14.75
Heavy melting steel, Phila.	8.25	8.25	8.50	12.50
Heavy melting steel, Ch'go	8.00	8.00	8.25	11.50
Carwheels, Chicago	9.50	9.50	9.50	13.50
Carwheels, Philadelphia	12.00	12.00	12.00	15.00
No. 1 cast, Pittsburgh	10.00	10.00	10.50	13.25
No. 1 cast, Philadelphia	11.50	11.50	11.50	13.00
No. 1 cast, Ch'go (net ton)	8.50	8.50	8.50	11.00
No. 1 RR. wrot., Phila.	10.00	10.00	10.00	15.00
No. 1 RR. wrot., Ch'go (net)	7.00	7.00	7.00	9.25

Coke, Connellsville, Per Net Ton at Oven:				
Furnace coke, prompt	$2.40	$2.40	$2.40	$2.60
Foundry coke, prompt	3.50	3.50	3.50	3.50

Metals, *Per Lb. to Large Buyers:*	Cents	Cents	Cents	Cents
Lake copper, New York	7.37½	7.37½	7.62½	10.12½
Electrolytic copper, refinery	6.75	6.75	7.00	9.75
Tin (Straits), New York	23.12½	22.25	25.45	24.62½
Zinc, East St. Louis	3.45	3.57½	3.75	4.00
Zinc, New York	3.80	3.92½	4.10	4.35
Lead, St. Louis	3.82½	3.82½	4.22½	4.95
Lead, New York	4.00	4.00	4.40	5.10
Antimony (Asiatic), N. Y.	6.50	6.55	6.60	7.25

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

for line pipe is dull, and mills are rapidly completing shipments against orders placed during the summer. As a result, output of electric weld and seamless pipe may be expected to decline between now and Nov. 1. Standard pipe shows little improvement, although some increase in jobber demand is expected as the weather grows colder. Oil country goods are still very quiet, and improved business probably awaits the settlement of some of the proration problems which face the industry.

WIRE PRODUCTS

Activity in the merchant wire market which prevailed at the end of the quarter has largely subsided, but the general run of orders is no lower than it was in September. Manufacturers' wire is exceptionally dull, but tonnage is expected from the automobile industry before the end of the month. Nail prices are rather well held at $1.90 a keg, Pittsburgh, and manufacturers' wire continues at 2.20c.

SHEETS

With buying by the automobile industry gaining more momentum and other consuming groups reflecting additional activity, the sheet market shows more life than it has for several months. Unusual orders placed by two or three large motor car builders last week are expected to be followed up by additional tonnage for new models in the next few days, and mills will be able to ship some of this material during October. Better demand from the farm implement makers is also reported, and movement of stock for railroad car roofing is more promising. Several railroads are reported to have extensive car improvement programs under way. Sheet tonnage from the radio industry has also taken a spurt in the last week, and will continue active for a time as producers begin construction of new models for the holiday season. No change in the rate of requirements in other consuming industries is reported, but the general run of small orders is holding up. Sheet production is fairly well maintained on the average, but individual mill operations are very spotty. The industry is still running at about 30 per cent of capacity, with output of full-finished stock somewhat heavier. Prices are unchanged and reflect strength, even where large buyers are concerned.

TIN PLATE

Specifications are still light and are only sufficient to support production schedules at about 40 per cent of capacity. The leading makers have not yet undertaken the rolling of anticipated tonnage for next year's shipment, but have had some releases on this business and can begin when they find it convenient. The price readjustment announced on Oct. 1 has

THE IRON AGE COMPOSITE PRICES

	Finished Steel	Pig Iron	Steel Scrap
Oct. 13, 1931	2.116c. a Lb.	$15.34 a Gross Ton	$8.83 a Gross Ton
One week ago	2.116c.	15.34	8.83
One month ago	2.116c.	15.42	9.17
One year ago	2.135c.	16.29	12.92
	Based on steel bars, beams, tank plates, wire, rails, black pipe and sheets. These products make 87 per cent of the United States output.	Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.	Based on No. 1 heavy melting steel quotations at Pittsburgh, Philadelphia and Chicago.

	Finished Steel High	Finished Steel Low	Pig Iron High	Pig Iron Low	Steel Scrap High	Steel Scrap Low
1931	2.142c., Jan. 13	2.102c., June 2	$15.90, Jan. 6	$15.34, Oct. 6	$11.33, Jan. 6	$8.83, Oct. 6
1930	2.362c., Jan. 7	2.121c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.412c., April 2	2.362c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3
1928	2.391c., Dec. 11	2.314c., Jan. 3	18.59, Nov. 27	17.04, July 24	16.50, Dec. 31	13.08, July 2
1927	2.453c., Jan. 4	2.293c., Oct. 25	19.71, Jan. 4	17.54, Nov. 1	15.25, Jan. 11	13.08, Nov. 22
1926	2.453c., Jan. 5	2.403c., May 18	21.54, Jan. 5	19.46, July 13	17.25, Jan. 5	14.00, June 1
1925	2.560c., Jan. 6	2.396c., Aug. 18	22.50, Jan. 13	18.96, July 7	20.83, Jan. 13	15.08, May 5

had little effect on the rate of specifications.

STRIP STEEL

While the automobile companies have placed some orders in the last week, the rate of current releases has not been affected, and production of strip steel remains at recent low levels. Buying from other sources is negligible, but market sentiment has improved greatly. Prices are well maintained at 1.55c. and 1.65c., Pittsburgh, on hot-rolled strip, and 2.15c. to 2.25c. on cold-rolled.

COAL AND COKE

Colder weather has brought some improvement in demand for domestic coal and coke, but the other grades are still very quiet. Some demand for water gas furnace coke continues, but large orders are lacking. The price is unchanged at $2.40, Connellsville. Foundry coke is quiet, but shipments are holding at recent levels, with the price unchanged at $3.25 to $4.50 a ton.

OLD MATERIAL

The scrap market has been particularly dull in the last week, with scarcely any important mill buying reported. On the basis of the most recent sales, No. 1 heavy melting steel is quotable at $10 to $10.50, although some of the railroad lists which have closed in the last week have brought out somewhat higher prices. One large carrier is reported to have withheld sale of the rails on its last list, and this commodity is particularly scarce. Shipments of hydraulic compressed sheets from Detroit by means of a combination water and rail rate via Fairport, Ohio, are still being made into the Youngstown district, and some of this material is coming into Pittsburgh. The rail rate from Fairport to the Pittsburgh district is only $1.89 a ton, compared with $2.90 from other Lake Erie shipping points and, with comparatively cheap water haul, a substantial saving from the all-rail rate is available. However, this unusual rate from Fairport is expected to be withdrawn before the end of the year, establishing a more equitable consumer relationship. The other grades of scrap show little price variation. Dealers are still accumulating material for laying down in their yards.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
No. 1 heavy melting steel	$10.00 to $10.50
No. 2 heavy melting steel	9.00 to 9.50
Scrap rails	10.25 to 10.75
Compressed sheet steel	9.75 to 10.25
Bundled sheets, sides and ends	9.50 to 10.00
Cast iron carwheels	10.50 to 11.00
Sheet bar crops, ordinary	11.00 to 11.50
Heavy breakable cast	8.00 to 8.50
No. 2 railroad wrought	10.00 to 10.50
Hvy. steel axle turnings	9.50 to 10.00
Machine shop turnings	7.00 to 7.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	11.50 to 12.00
Railr. coil and leaf springs	11.50 to 12.00
Rolled steel wheels	11.50 to 12.00
Low phos. billet and bloom ends	13.50 to 14.00
Low phos. mill plates	12.00 to 12.50
Low phos. light grades	12.00 to 12.50
Low phos. sheet bar crops	13.00 to 13.50
Heavy steel axle turnings	9.50 to 10.00
Electric Furnace Grades:	
Low phos. punchings	12.50 to 13.00
Heavy steel axle turnings	9.50 to 10.00
Blast Furnace Grades:	
Short shoveling steel turnings	7.25 to 7.75
Short mixed borings and turnings	7.25 to 7.75
Cast iron borings	7.25 to 7.75
Rolling Mill Grades:	
Steel car axles	16.50 to 17.50
Cupola Grades:	
No. 1 cast	9.50 to 10.50
Rails 3 ft. and under	12.00 to 12.50

Warehouse Prices, f.o.b. Pittsburgh

	*Base per Lb.
Plates	2.85c.
Structural shapes	2.85c.
Soft steel bars and small shapes	2.60c.
Reinforcing steel bars	2.60c.
Cold-finished and screw stock—	
Rounds and hexagons	3.10c.
Squares and flats	3.60c.
Bands	2.95c.
Hoops	3.95c.
Hot-rolled annealed sheets (No. 24), 25 or more bundles	3.05c.
Galv. sheets (No. 24), 25 or more bundles	3.40c.
Hot-rolled sheets (No. 10)	3.15c.
Galv. corrug. sheets (No. 28), per square (less than 3750 lb.)	3.74c.
Spikes, large	2.50c.
Small	2.75c. to 2.90c.
Boat	3.00c.
Track bolts, all sizes, per 100 count,	70 and 10 per cent off list
Machine bolts, 100 count,	70 and 10 per cent off list
Carriage bolts, 100 count,	70 and 10 per cent off list
Nuts, all styles, 100 count,	70 and 10 per cent off list
Large rivets, base per 100 lb.	$3.20
Wire, black, soft ann'l'd, base per 100 lb.	2.30
Wire, galv. soft, base per 100 lb.	2.75
Common wire nails, per keg	2.05
Cement coated nails, per keg	2.05

*On plates, structurals, bars, reinforcing bars, bands, hoops and blue annealed sheets, base applied to orders of 400 to 999 lb.

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Unfilled Orders Drop Sharply

Unfilled orders of the United States Steel Corpn. as of Sept. 30 amounted to 3,144,833 tons. This represents a drop of 24,624 tons from the total Aug. 31—just below the average decline during August for the years 1910 to 1930 inclusive. In the ten years, 1921 to 1930, however, the average change was an increase of about 95,000 tons.

Unfilled orders at end of each month since the beginning of 1929 follow:

	1931	1930	1929
January	4,132,351	4,468,710	4,109,487
February	3,965,194	4,479,748	4,144,341
March	3,995,330	4,570,653	4,410,718
April	3,897,729	4,354,220	4,427,763
May	3,620,452	4,059,227	4,304,167
June	3,479,323	3,968,064	4,256,910
July	3,406,816	4,022,055	4,088,177
August	3,169,457	3,580,204	3,658,211
September	3,144,833	3,424,338	3,902,581
October	.....	3,481,763	4,086,562
November	.....	3,639,636	4,125,345
December	.....	3,943,596	4,417,193

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Arthur G. McKee & Co., consulting and contracting engineers, Cleveland, report net profits of $462,630 after all charges including reserves and Federal taxes for the nine months ending Sept. 30. This compares with $453,998 for the first nine months of 1930.

CHICAGO

Ingot Operating Rate Off Slightly as Steel Orders Decline

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CHICAGO, Oct. 13.—Ingot production is again under pressure, with little assurance that large consuming industries will come to the rescue in the immediate future. The holiday this week, combined with erratic order mails, has depressed production close to 27 per cent of capacity. However, with backlogs extremely light it is only natural that there should be some fluctuation from week to week. Pig iron is again accumulating at steel mills, and a sizable tonnage of ingots has been laid on the bank. It is not improbable that one blast furnace will be blown out unless the trend of demand is reversed.

So far this year the structural steel market has afforded substantial business to mills, but recently inquiries have turned dull, and to this situation must be added the hold-back in Illinois State work while the wage law is being fought through the courts. This wage question has stopped much road work, and bar bending shops report a marked drop in shipments. It is estimated that fully 12,000 men are out of work because of this controversy.

On the brighter side of the market are announcements by some farm equipment manufacturers that they will start production in November. This industry is already making some inquiries for steel, and a few limited purchases have been closed.

The railroad situation is unaltered, orders for 30 tank cars and three gas-electric units comprising most of recent business. The market for used freight car parts is quite active, and one report after another is heard that idle cars are being stripped of serviceable parts for use in cars that are needed on the road. The rail market is still a puzzle to most sellers. Inquiries that had been expected by this time have not made their appearance and the tonnages to be bought are open to much discussion, the thought being in the minds of some that in many instances 1932 needs will be pared below the tonnages stated in this year's contracts.

Ingot output in Chicago district tapers slightly. One blast furnace may be blown out.

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Some farm equipment manufacturers will start production in November.

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Rail inquiries that were expected by this time have not made their appearance.

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Pig iron shipments running 20 per cent ahead of September rate.

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PIG IRON

Shipments of northern foundry iron are running 20 per cent above the rate in the preceding month. About a week ago the increased rate was about 15 per cent, thus indicating an upward trend in the melt. One merchant blast furnace has been blown out, but the two that remain in blast, out of six in the district, are producing the same tonnage as made when three were in use. Stocks in the hands of producers have not changed in volume. The Wells charcoal iron furnace has been lighted, thereby ending a long period during which none of this commodity was produced. A few sales of Southern iron indicate that the price is well established at $11 a ton, Birmingham.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25	$17.00 to $17.50
N'th'n No. 1 fdy., sil. 2.25 to 2.75	17.50 to 18.00
Malleable, not over 2.25 sil.	17.00 to 17.50
High phosphorus	17.00 to 17.50
Lake Super. charcoal, sil. 1.50	25.04 to 27.04
S'th'n No. 2 fdy.	17.01
Low phos., sil. 1 to 2, copper free	28.50 to 29.20
Silvery, sil. 8 per cent	24.79 to 26.79
Bess. ferrosilicon, 14-15 per cent	35.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnaces, not including an average switching charge of 61c. per gross ton.

FLUORSPAR

A few carloads have been placed locally at $13 a ton, Kentucky mines. Shippers from west Kentucky are attending a meeting in Chicago today in a move to obtain reduced rail rates east as a measure to compete with rail and water shipments from southern Illinois.

BARS

A moderate increase in specifications for mild steel bars has occurred. Tonnages moving from mills are generally in small lots and in mixed sizes, which adds to the difficulty of meeting promises of delivery and to the cost of mill operation. Prices for mild steel bars are here and there showing some variation as consumers drive harder for concessions. The alloy steel bar market remains listless, with most large consumers operating at low rates. Word now comes from Milwaukee that one of the farm equipment manufacturers with a plant in that city will resume output Nov. 2. Rail steel bars to the manufacturing trade are now being quoted at 1.50c. to 1.60c. a lb., Chicago Heights mills. Bed manufacturers are experiencing a dull fall season and their needs are reaching mills in small and frequent lots. Backlogs are almost absent, and there is no disposition now to buy ahead. Dealers are not able to move their stocks of fence posts and new orders placed at mills are extremely light.

SHEETS

Prices are holding in a market which will not support operations above a range of 25 to 30 per cent of capacity. Small orders continue to reach mills from diversified users, who are not willing to commit themselves beyond immediate needs.

Base prices per lb., deliv'd from mill in Chicago: No. 24 hot-rolled annealed, 2.55c.; No. 24 galv., 3.05c.; No. 10 hot-rolled, 1.85c. Deliv'd prices at other Western points are equal to the freight from Gary, plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

CAST IRON PIPE

In the absence of large tonnages, sellers in this district are adhering closely to a price schedule that ranges from $34 to $36 a ton, Birmingham, for 6-in. and larger diameters. The higher quotation applies to lots up to 200 tons each, where the price becomes $35. Pontiac, Mich., has ordered 155 tons and Ambia, Ind., has taken a small tonnage. Iron Mountain, Mich., has closed for 2000 ft. of 6-in. pipe. Activity in this market is at low ebb.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, $42 to $44; 4-in., $45 to $47; Class A and gas pipe, $3 extra.

REINFORCING BARS

The drive for tonnages continues to press down prices in a market that is gradually growing less active. Rail steel reinforcing bars are selling as low as 1.20c. a lb., and the billet steel commodity is moving at 1.40c. a lb., Chicago warehouse. Recent sales are small for this time of year, and fresh inquiries promise no marked improvement in the near future. The Illinois wage law dispute is now before the State Supreme Court. In the meantime, much road and institutional work is at a standstill, and it is estimated that fully 12,000 men are out of work because of this tangle which

is directly responsible for a sharp drop in shipments of reinforcing bars.

BOLTS, NUTS AND RIVETS

Orders from the automobile trade are slowly improving, and releases by farm implement manufacturers are turning upward. Prices are not strong.

FERROALLOYS

Shipments and specifications so far in October point to the possibility that this will be the best month since the first quarter.

RAILS AND TRACK SUPPLIES

The expected rail inquiry by the Santa Fe has not materialized, though it is thought in some quarters that it will be before the trade in the next few days. There is much speculation as to the size of this inquiry, it being in the minds of some sellers that it may not equal the 60,000 tons taken last year. Chicago rail mills are operating on meager schedules that are supported by limited tonnages being taken for work that is to be finished before winter weather sets in.

WAREHOUSE BUSINESS

Jobbers in this district are somewhat encouraged, as orders show moderate improvement. Prices at warehouses are steady.

WIRE PRODUCTS

The moderate, though steady, growth in specifications of the past two to three weeks has been checked, and there are at present no certain signs of tonnage activity. Prices are fairly steady. A few orders for copper wire have been entered, but use of this commodity is far below that usually expected at this time of year. A few pick-up orders are being entered for mesh for concrete reinforcement, but shipments are tapering rapidly as freezing weather approaches. Wire mills are producing in the range from 25 to 30 per cent of capacity.

STRUCTURAL MATERIAL

Awards, influenced strongly by two school lettings in Chicago, total more than 10,000 tons, but fresh inquiries are light at about 4000 tons. The outlook for construction in this district is distinctly discouraging. Many projects have been planned, but for one reason or another they do not get under way. Fabricators bid closely for such jobs as come up and then shop for the steel. By this method they are at times successful in getting $2 below the current market.

PLATES

Demand for this commodity is shrinking in the absence of pipe orders and use of large consumers such as car builders. This market is also adversely affected by enforced regulation of oil production, storage facilities being adequate for current needs. There is talk here of extending a branch pipe line to carry natural gas to Milwaukee from the line that is to serve Chicago. In the railroad equipment field the only orders are for 30 tank cars for the Continental Oil Co. and three gas-electric cars for the Santa Fe and the Missouri-Kansas-Texas railroads. The Coast Guard will take bids on a 400-ton cutter for service on Lake Michigan. Among new projects that will require a tonnage of plates is Lock No. 4 at Alma, Wis., on the Mississippi River. Current shipments of plates are shrinking, and there are no sizable projects in sight. Much of the recent loss in ingot output can be traced to lighter demand for plates.

COKE

Shipments of coke are slowly turning upward. Part of this change is the result of slightly heavier melt, but it is also influenced by the approach of the heating season.

OLD MATERIAL

This market is again leaning to the weak side, following sharp curtailment of acceptances by a local steel mill. The Santa Fe published a long list and after reviewing bids withdrew it. The outlet for scrap acquired by dealers is extremely limited, and it is almost impossible to get a consumer to speculate by putting it on the ground. With the market in this condition, there has been revived the subject of accumulating a cargo of heavy melting steel for shipment to a Lake Erie port. The action of cast iron boring prices, which have been affected by such a move, makes this seem desirable. However, the question of rejections at point of delivery makes dealers rather timid. On a sale of a few hundred tons of couplers the market gave way 50c. a ton. Punchings are in demand for bridge ballast and borings are still being accumulated for boat shipment.

Prices del'd Chicago dist. consumers:

Per Gross Ton	
Basic Open-Hearth Grades:	
Heavy melting steel	$7.75 to $8.25
Shoveling steel	7.75 to 8.25
Frogs, switches and guards, cut apart, and misc. rails	8.00 to 8.50
Factory hyd. comp. sheets	6.50 to 7.00
Drop forge flashings	6.00 to 6.50
No. 1 busheling	6.00 to 6.50
Forg'd cast and r'l'd steel carwheels	8.50 to 9.00
Railroad tires, charg. box size	10.00 to 10.50
Railroad leaf springs cut apart	9.75 to 10.25
Axle turnings	6.00 to 6.50
Acid Open-Hearth Grades:	
Steel couplers and knuckles	8.50 to 9.00
Coil springs	10.00 to 10.50
Electric Furnace Grades:	
Axle turnings	6.00 to 6.50
Low phos. punchings	10.50 to 11.00
Low phos. plates, 12 in. and under	9.50 to 10.00
Blast Furnace Grades:	
Cast iron borings	4.00 to 4.50
Short shoveling turnings	4.00 to 4.50
Machine shop turnings	4.00 to 4.50
Rolling Mill Grades:	
Rerolling rails	10.00 to 10.50
Cupola Grades:	
Steel rails, less than 3 ft.	10.25 to 10.75
Steel rails, less than 2 ft.	11.00 to 11.50
Angle bars, steel	9.25 to 9.75
Cast iron carwheels	9.50 to 10.00
Malleable Grades:	
Railroad	7.50 to 8.00
Agricultural	7.50 to 8.00
Miscellaneous:	
*Relaying rails, 56 to 60 lb.	19.00 to 21.00
*Relaying rails, 65 lb. and heavier	22.00 to 27.00
Per Net Ton	
Rolling Mill Grades:	
Iron angle and splice bars	8.00 to 8.50
Iron arch bars and transoms	8.50 to 9.00
Iron car axles	15.50 to 16.50
Steel car axles	11.50 to 12.00
No. 1 railroad wrought	6.75 to 7.25
No. 2 railroad wrought	6.75 to 7.25
No. 1 busheling	5.50 to 6.00
No. 2 busheling	4.00 to 4.50
Locomotive tires, smooth	11.50 to 12.50
Pipes and flues	5.50 to 6.00
Cupola Grades:	
No. 1 machinery cast	8.50 to 9.00
No. 1 railroad cast	7.00 to 7.50
No. 1 agricultural cast	7.00 to 7.50
Stove plate	6.25 to 6.75
Grate bars	5.50 to 6.00
Brake shoes	5.75 to 6.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Warehouse Prices, f.o.b. Chicago

	Base per Lb.
Plates and structural shapes	3.00c.
Soft steel bars	2.75c.
Reinforcing bars, billet steel	1.40c. to 1.80c.
Rail steel reinforcement—	
For buildings	1.20c. to 1.50c.
Highway slabs	1.40c.
For bridges and culverts	1.50c.
Cold-fin. steel bars and shafting—	
Rounds and hexagons	3.10c.
Flats and squares	3.60c.
Bands, $\frac{3}{8}$ in. (in Nos. 10 and 12 gages)	2.95c.
Hoops (No. 14 gage and lighter)	3.50c.
Hot-rolled annealed sheets (No. 24)	3.55c.
Galv. sheets (No. 24)	4.10c.
Hot-rolled sheets (No. 10)	3.20c.
Spikes ($\frac{7}{16}$ in. and larger)	3.45c.
Track bolts	4.30c.
Rivets, structural	4.00c.
Rivets, boiler	4.00c.
	Per Cent Off List
Machine bolts	73
Carriage bolts	73
Coach and lag screws	73
Hot-pressed nuts, sq., tap. or blank	73
Hot-pressed nuts, hex., tap. or blank	73
No. 8 black ann'l'd wire, per 100 lb.	$3.45
Com. wire nails, base per keg	2.30
Cement c't'd nails, base per keg	2.30

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British Production of Pig Iron and Steel

LONDON, Oct. 13 (*by cable*).—Output of pig iron in Great Britain in September was 248,200 gross tons, with steel ingots and castings at 400,500 tons. Pig iron showed a decrease from August, in which month production was 275,700 tons. Steel ingots and castings increased from the 375,300 tons of August.

Production for the first nine months of 1931, with comparisons of monthly averages of recent years, and of 1913, are shown below:

Date	Pig Iron	Steel
1913	855,000	638,600
1928	550,800	710,000
1929	632,400	804,600
1930	516,400	608,200
1931—January—	337,200	402,200
February	318,200	486,400
March	357,100	500,100
April	323,200	397,400
May	346,500	435,100
June	323,800	428,900
July	317,000	428,700
August	275,700	375,300
September	248,200	400,500

CLEVELAND

Automobile Industry Releases Orders to Parts Makers for New Models

CLEVELAND, Oct. 13.—Conditions appear slightly better in the finished steel market this week because of the purchase of some steel by the motor car industry, the release of orders to parts makers and new inquiries for parts. Both the Ford Motor Co. and the Chevrolet Motor Co. have placed orders with stamping plants in this territory for running boards for their new models and deliveries will start at the end of the month. The Chevrolet company has issued releases to several other parts makers for deliveries to start Nov. 1. The Ford company is also reported to have purchased a moderate volume of sheets. The Chevrolet company is inquiring for wheels for the first half of 1932 and mills are figuring on inquiries for two good-sized lots of rim steel.

Some good business here has been placed in screw machine products, which should stimulate the demand for cold-finished steel bars. As several motor car manufacturers will get under production on their new models about Nov. 1, the coming two months are expected to be fairly active both for the automobile makers and the forging, stamping and other plants that cater to that industry.

Sentiment in the steel industry has improved somewhat, although no increased activity is reported by metalworking plants in this territory outside of the motor car field. There are no new inquiries from the railroads.

Steel plant operations in Cleveland were increased this week by the net addition of one open-hearth furnace. These plants are now operating 12 of 34 open-hearths, or at 35 per cent of ingot capacity. Two steel companies started up an additional furnace and a third shut down one furnace.

Prices are firm on practically all products. While orders are not large enough to form a market test on the heavier rolled steel products, there are few reports of efforts to obtain concessions.

PIG IRON

With a light volume of sales and inquiries, the improvement reported last week has not been maintained. Consumers are buying in small lots and see no reason for covering beyond their early needs. The largest inquiry pending in this territory is for 200 tons. Shipping orders are slightly better in northern Ohio, but no gain is reported from the motor car foundries in the Michigan territory and improved demand from that source is not expected before the end of the month. Small releases for malleable iron have come from foundries that make castings for the Ford Motor Co. The new Ford model will take 50 lb. more of malleable castings than the present model A, according to estimates of some foundrymen. Prices are steady in the immediate territories, although there still are reports of concessions on Lake iron for shipment to outside districts. Prices in Michigan and Indiana have not been affected by the 50c. decline to $17 in Chicago, as that has been the ruling price in the former State and the maximum in the latter. Lake furnaces quote foundry and malleable iron at $16 to $17 for outside shipment and at $17 for local delivery.

Prices per gross ton at Cleveland:

N'th'n fdy., sil. 1.75 to 2.25	$17.00
S'th'n fdy., sil. 1.75 to 2.25	17.01
Malleable	17.00
Ohio silvery, 8 per cent	24.00
Stand. low phos., Valley	27.00

Prices are f.o.b. furnace except on Southern foundry and silvery iron. Freight rates: 50c. average local switching charge; $3 from Jackson, Ohio; $6.01 from Birmingham.

IRON ORE

Ore on Lake Erie docks Oct. 1 amounted to 5,973,654 tons, against 6,043,489 tons on the same date a year ago. These docks received 2,873,135 tons in September and 12,270,487 tons during the season up to Oct. 1, against 26,329,960 tons during the same period last year. September shipments from these docks were 1,847,648 tons. Up to Oct. 1 the total was 9,426,591 tons, compared with 19,406,840 tons for the same period in 1930. Receipts at other than Lake Erie ports until Oct. 1 were 7,023,076 tons, against 11,670,386 tons during the same period last year.

SHEETS

Ford Motor Co. is understood to have purchased a round tonnage of sheets during the week. New demand in this territory continues very slow and is for immediate needs. The Ford company has placed an order with a Cleveland stamping plant for running boards, this being the first business reported placed with parts makers for material for the company's new models. Fisher Body Co. continues to release small lots for its Cleveland plant for the new model Chevrolet bodies. A fair tonnage is coming from the refrigerator industry and a little business from the barrel manufacturers and metal furniture plants. The stove industry is very quiet. No deviation from regular prices is reported.

STRIP STEEL

Inquiry for hot-rolled strip has improved, although there was not much gain in actual orders during the week. Makers of automobile parts have not yet closed on some pending business. Hot-rolled strip is firm at 1.55c., Pittsburgh, for wide and 1.65c. for narrow. There is little activity in cold-rolled material. All the leading manufacturers are adhering to the regular 2.15c., Cleveland, base.

BARS, PLATES AND SHAPES

Orders are slightly more numerous than recently, but still are for small lots. Activity in the structural field was very light the past week, although there were several inquiries for lots under 100 tons. Several jobs requiring round tonnages of reinforcing bars are still pending. The Cleveland sewage disposal plant, taking 4700 tons of bars, on which bids are to be taken Oct. 23, is complicated by requirements of deliveries which will extend over at least two years. Prices are steady at 1.65c., Cleveland, for steel bars either delivered locally or at mill for outside shipment and 1.60c., Pittsburgh, for plates and shapes.

WIRE PRODUCTS

While demand is not active, prices are well maintained. Following the cancellation Oct. 1 of nail contracts taken at below $1.90 a keg, jobbers have advanced their stock price 15c. a keg to $2.25.

OLD MATERIAL

Demand from consumers has further declined to near the vanishing point. A Cleveland mill has discontinued taking blast furnace scrap. About the only activity in the Valley district is in machine shop turnings, which are being taken by two consumers, and for which dealers are paying $6.50, delivered. Local prices are unchanged and nominal, being largely based on prices scrap will bring delivered in the Youngstown district.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel	$8.50 to	$9.00
No. 2 heavy melting steel	7.50 to	8.00
Compressed sheet steel	7.50 to	7.75
Light bundled sheet stampings	6.50 to	7.00
Drop forge flashings	6.75 to	7.00
Machine-shop turnings	5.00 to	5.50
Short shoveling turnings	6.50 to	7.00
No. 1 railroad wrought	9.50 to	10.00
No. 2 railroad wrought	10.00 to	10.50
No. 1 busheling	6.75 to	7.00
Pipes and flues	5.50 to	6.00
Steel axle turnings	7.50 to	8.00
Acid Open-Hearth Grades:		
Low phos., billet bloom and slab crops	14.00 to	14.50
Blast Furnace Grades:		
Cast iron borings	6.50 to	6.75
Mixed borings and short turnings	6.50 to	6.75
No. 2 busheling	6.00 to	6.25
Cupola Grades:		
No. 1 cast	10.00 to	10.50
Railroad grate bars	6.00 to	6.50
Stove plate	6.00 to	6.50
Rails under 3 ft	15.00 to	15.50
Miscellaneous:		
Rails for rolling	13.00 to	13.50
Railroad malleable	11.00 to	11.25

NEW YORK

Steel and Pig Iron Purchases Still in Small Volume

NEW YORK, Oct. 13.—Inquiry for pig iron is limited. Except in a few scattered instances, interest in forward buying is practically dormant. A New England melter is reported to be negotiating on a tonnage of foundry iron for early barge delivery, and the A. P. Smith Mfg. Co., East Orange, N. J., is inquiring for 300 tons of No. 2 and No. 2X foundry iron for first quarter delivery. Sales for the week totaled about 4000 tons, compared with 2500 tons the previous week and 3000 tons two weeks ago. Prices are highly competitive, with some weakness in eastern Pennsylvania iron. Pig iron stocks at seaboard remain far from depletion, and, in the face of uncertain business conditions, furnaces using these storage facilities are making little provision for replenishing stocks in anticipation of winter demand.

According to figures received by THE IRON AGE, pig iron and billets shipped via the New York State Canal during the present navigation season up to and including September amounted to 56,262 tons.

Prices per gross ton, delivered New York district:

*Buff. No. 2, del'd east. N. J.	$17.78 to $18.28
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	16.89 to 17.39
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	17.89 to 18.39

Freight rates: $1.39 to $2.52 from eastern Pennsylvania.

*Prices delivered to New Jersey cities having rate of $3.28 a ton from Buffalo.

CAST IRON PIPE

Prices per net ton delivered New York: Water pipe, 6-in. and larger, $32.90; 4-in. and 5-in., $35.90; 3-in., $42.90. Class A and gas pipe, $3 extra.

FINISHED STEEL

While there is an occasional slight spurt in buying of some steel products, it cannot be said that business as a whole in this market is showing any forward tendency. One development to which some significance is attached is that some buyers who have not been in the market for months are again taking steel. A few tin plate contracts for the first half of 1932 have been signed, and, while shipments will not be made against these until January or February, mills probably will anticipate shipment by rolling some of the material during the remainder of this year.

CAST IRON PIPE

Following a lull of several weeks, activity in this market has become fairly brisk. Fresh inquiries include 1500 tons of 6 to 12-in. for the Latham Water District, Colonie, N. Y., and 200 tons of 4 and 8-in. for Ocean Beach, Suffolk County, N. Y. Awards made during the week included the following: 500 tons of 10-in. for a Pennsylvania water company and a like amount for a New York State utility, to Warren Foundry & Pipe Corpn.; 480 tons for the State Prison at Dannemora, N. Y., and 450 tons of 8-in. for Bedford Hills, N. Y., to Donaldson Iron Works; 600 tons for Tupper Lake, N. Y., to American Cast Iron Pipe Co., and 500 tons of sizes up to 12 in. for Spencerport, N. Y., to United States Pipe & Foundry Co.

REINFORCING BARS

Prices are unchanged at 1.60c., Pittsburgh, or 1.93c., delivered, New York, with concessions of $1 and $2 a ton on desirable projects. The greater part of present inquiry is for small construction, requiring less than carload lots. The general contractor on the parcel post building in New York, George F. Driscoll, Brooklyn, has awarded the foundation work to the Corbetta Concrete Co., which will buy the reinforcing bars. The only sizable new project is a garbage disposal plant on East 150th Street, requiring about 200 tons of bars.

OLD MATERIAL

Small tonnages of No. 1 heavy melting steel are moving to the consumer at Coatesville, Pa., and some No. 2 steel is going to Conshohocken, Pa. Except for these shipments to eastern Pennsylvania and continued loading of No. 1 steel on barges in New York harbor for shipment to a Buffalo mill, the market is quiet. Dealers are transacting a small tonnage business in distress carload lots of various grades of scrap, and on these transactions extremely low prices are occasionally made to dispose of material which must be moved.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	$4.50 to	$6.25
Heavy melting steel (yard)		3.00
No. 1 hvy. breakable cast		6.00
Stove plate (steel works)		3.50
Locomotive grate bars		2.50
Machine shop turnings		2.00
Short shoveling turnings		2.00
Cast borings (blast fur. or steel works)		2.50
Mixed borings and turnings		2.00
Steel car axles	12.25 to	12.75
Iron car axles	15.00 to	15.50
Iron and steel pipe (1 in. dia., not under 2 ft. long)		5.50
Forge fire	3.25 to	3.75
No. 1 railroad wrought		7.75
No. 1 yard wrought, long		6.75
Rails for rolling	6.25 to	6.50
Stove plate (foundry)	4.75 to	5.50
Malleable cast (railroad)	6.00 to	6.50
Cast borings (chemical)	8.00 to	8.50

Prices per gross ton, deliv'd local foundries:

No. 1 machinery cast	$8.50
No. 1 hvy. cast (columns, bldg. materials, etc.; cupola size)	6.50
No. 2 cast (radiators, cast boilers, etc.)	5.50

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and struc. shapes	2.70c. to 3.10c.
Soft steel bars, small shapes	2.70c. to 3.10c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock:	
Rounds and hexagons	3.40c.
Flats and squares	3.90c.
Cold-roll. strip, soft and quarter hard	4.95c.
Hoops	3.75c.
Bands	3.40c.
Hot-rolled sheets (No. 10)	3.00c. to 3.25c.
Hot-rolled ann'l'd sheets (No. 24*)	3.60c.
Galvanized sheets (No. 24*)	4.00c.
Long terne sheets (No. 24)	5.00c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, ½ x ½ in. and larger	3.40c.
Smooth finish, 1 to 2½ x ¾ in. and larger	3.75c.
Open-hearth spring steel, bases,	4.50c. to 7.00c.

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	65 to 65 and 10
1 x 30 in. and smaller	65 to 65 and 10
Carriage bolts, cut thread:	
½ x 6 in. and smaller	65 to 65 and 10
¾ x 20 in. and smaller	65 to 65 and 10
Boiler Tubes:	Per 100 Ft.
Lap welded, 2-in.	$19.00
Seamless steel, 2-in.	20.25
Charcoal iron, 2-in.	26.25
Charcoal iron, 4-in.	67.00

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Small Tool Sales in 1929 Were $140,987,000

WASHINGTON, Oct. 13. — Sales in 1929 by 722 manufacturing plants engaged primarily in making machine tool accessories and small metalworking tools totaled $140,987,000, of which 75.6 per cent, or $106,441,000, represented the quantity sold direct to industrial consumers. These manufacturers, who have reported to the Census of Distribution, principally make punch press equipment, such as sub-presses, punches, dies, etc, milling cutters, reamers, chucks, drills, taps, threading tools, etc., as well as specially designed equipment, tools and machinery.

Sales to dealers accounted for 22.6 per cent, or $31,991,000, of the total sales. Manufacturing plants sold 1.8 per cent, or $2,555,000 worth of goods to their own sales branches. Of sales to dealers and industrial consumers, $13,565,000 was made through manufacturers' agents, selling agents, brokers or commission houses. Seventy-nine manufacturing plants sold through such agents, 16 of them selling their entire output in this way.

PHILADELPHIA — Steel Buying Is Smaller—Pig Iron Prices Weak

PHILADELPHIA, Oct. 13.—Steel buying has been less active than in the previous two weeks, and operating rates of certain eastern Pennsylvania mills, which had increased slightly, have declined to the former level, making the average for the district 26 per cent of capacity. Inquiry for plates is fair, but only a small tonnage is being placed. General sentiment continues fairly hopeful despite bank closings in Philadelphia, a condition expected by sellers to cause additional delays in collections. Automobile body makers have not yet increased output, but are expecting early releases on contracts with Detroit car manufacturers.

Building contracts are limited to small projects, but these are more numerous than a few weeks ago, so that small fabricating shops have some business in prospect. Allocation of rail contracts has not yet been made, but action is expected soon by the Delaware & Hudson and the Boston & Maine. Rail mills are awaiting with interest the decision on freight rates, and believe that, should an advance be granted, rail specifications for next year will be increased.

PIG IRON

Carload business is still being placed in fair volume, with certain consumers averaging down current small contracts by alternating contract deliveries with carload lots at the present lower price level. Carload business is being taken in eastern Pennsylvania at $15.50 to $16, furnace, and the extra for silicon is often waived, even when sales are at $15.50 a ton. A Delaware River pipe shop, which has been practically closed for some months, has resumed operation on a limited scale. The blast furnace at Swedeland, Pa., expected to go out this week, is still in blast on certain grades which may be needed by customers while the furnace is out for relining.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	$16.26 to $16.76
East. Pa. No. 2X, 2.25 to 2.75 sil.	16.76 to 17.26
East. Pa. No. 1X	17.26 to 17.76
Basic (del'd east. Pa.)	16.75
Malleable	19.00 to 20.00
Stand. low phos. (f.o.b. east. Pa. furnace)	23.00 to 24.00
Cop. b'r'g low phos. (f.o.b. furnace)	22.00 to 23.00
Va. No. 2 plain, 1.75 to 2.25 sil.	22.04
Va. No. 2, 2.25 to 2.75 sil.	22.54

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to $1.64 from eastern Pennsylvania furnaces; $4.54 from Virginia furnaces.

STEEL BARS

A small volume of business continues in miscellaneous lots for stock. Billet steel reinforcing bars are still subject to concessions of $1 and more a ton from 1.60c., Pittsburgh, or 1.89c., Philadelphia, for lots of more than a carload. Bids are being taken on about 150 tons of reinforcing bars for foundations of the new Philadelphia Post Office. About 300 tons has been awarded for a coal breaker at St. Nicholas, Pa., and 200 tons for the Richmond power plant in Philadelphia.

SHAPES

Fabricating shops are bidding on a slightly increased number of small projects, including the Thomas F. Bayard school at Wilmington, Del., a store building in Trenton, N. J., for the J. B. Van Sciver Co., and viaducts in connection with the new Pennsylvania terminal at Thirtieth Street and at Schuylkill Drive, requiring 1500 tons. The new Post Office, bids for the superstructure of which are not expected before the first of the year, will require about 10,000 tons of fabricated structural steel.

PLATES

Inquiry is fairly active, but in many cases prices are requested by a number of contractors submitting bids on the same project. Operating rates of mills are off slightly from two and three weeks ago, when there was a moderate upturn, but are still at about 25 per cent. Prices are unchanged and firm on current orders, which seldom exceed a carload.

SHEETS

The new Philadelphia Post Office probably will require about 500 tons of galvanized sheets for ventilating ducts and mail chutes, but the formal inquiry is not expected until after the first of the year. Radio manufacturers are still operating on curtailed schedules, but report a slight increase in local business within the past week. Automobile body and accessory makers expect releases on contracts with Detroit manufacturers. Sheet prices are firmly maintained despite efforts of buyers to obtain concessions.

IMPORTS

In the week ended Oct. 10, 1000 tons of pig iron arrived at this port from British India. Steel imports consisted of 1004 tons of structural shapes and 519 tons of round steel bars from Belgium, and 43 tons of structural shapes, seven tons of steel flats and four tons of round steel bars from Germany.

OLD MATERIAL

All grades of scrap are unchanged in price. The only activity is delivery of No. 1 heavy melting steel on contracts to the consumer at Coatesville, Pa., No. 2 steel to the mill at Conshohocken, Pa., and cast scrap to the Phoenixville user.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	$8.00 to $8.50
No. 2 heavy melting steel	7.00
No. 1 railroad wrought	10.00 to 10.50
Bundled sheets (for steel works)	6.00
Hydraulic compressed, new	7.00 to 7.50
Hydraulic compressed, old	6.00 to 6.50
Machine shop turnings (for steel works)	5.50 to 6.00
Heavy axle turnings (for equiv.)	8.00 to 8.50
Cast borings (for steel works and roll. mill)	5.50 to 6.00
Heavy breakable cast (for steel works)	9.50 to 10.00
Railroad grate bars	7.50
Stove plate (for steel works)	7.50
No. 1 low phos., hvy. (0.04% and under)	12.00 to 13.00
Couplers and knuckles	11.00
Rolled steel wheels	11.00
No. 1 blast furnace	5.50
Wrot. iron and soft steel pipe and tubes (new specific.)	10.50 to 11.00
Shafting	15.00 to 15.50
Steel axles	16.00 to 16.50
No. 1 forge fire	7.50 to 8.00
Cast iron carwheels	12.00 to 12.50
No. 1 cast	11.00 to 11.50
Cast borings (for chem. plant)	11.50 to 12.00
Steel rails for rolling	10.50

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.50c.
Structural shapes	2.50c.
Soft steel bars, small shapes, iron bars (except bands)	2.60c.
Reinforc. steel bars, sq., twisted and deform.	2.30c.
Cold-fin. steel, rounds and hex.	3.40c.
Cold-fin. steel, sq. and flats	3.90c.
Steel hoops	3.15c.
Steel bands, No. 12 to ⅞-in., inclu.	2.90c.
Spring steel	5.00c.
Hot-rolled, box annealed sheets (No. 24)	3.55c.
Galvanized sheets (No. 24)	4.00c.
Hot rolled blue annealed sheets (No. 10)	3.65c.
Diam. pat. floor plates, ¼-in.	5.20c.
Swedish iron bars	6.60c.

These prices are subject to quantity differentials except on reinforcing and Swedish iron bars.

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Trackwork Production at Low Ebb

Production of trackwork for T-rail track of 60 lb. and heavier was only 3472 net tons in September, according to the American Iron and Steel Institute. This is the lowest figure for any month since these reports were instituted, eight years ago. It represents a drop of 11½ per cent from the 3924 tons of August, the previous low, and of 39 per cent from the 5642 tons of September, 1930.

In nine months production was 54,418 tons, compared with 95,539 tons last year, a drop of 43 per cent.

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Standard Steel Car Corpn., Pullman-Standard Car Export Corpn., Osgood Bradley Car Corpn. and Steel Car Forge Corpn. have removed their New York office to 52 Vanderbilt Ave.

CINCINNATI

Pig Iron, Steel and Scrap Demands Show No Expansion

CINCINNATI, Oct. 13.—Demand for pig iron has not changed in the last week. Sales were about 1250 tons. The largest order was for 250 tons of Northern foundry iron for a central Ohio melter. Foundries are receiving a spotty demand for castings and are buying small quantities of iron for current use without inquiry.

Prices per gross ton, deliv'd Cincinnati:

Ala. fdy., sil. 1.75 to 2.25	$14.69
Ala. fdy., sil. 2.25 to 2.75	15.19
Tenn. fdy., sil. 1.75 to 2.25	14.69
S'th'n Ohio silvery, 8 per cent	23.89

Freight rates, $1.89 from Ironton and Jackson, Ohio; $3.69 from Birmingham.

FINISHED STEEL

The past week brought some purchases of sheets from automobile manufacturers, but not enough to make any change in the total demand. Railroads are not buying in this district, while the road construction field has let down in its requirements. Current business is keeping mills operating at slightly under 40 per cent of capacity.

OLD MATERIAL

While some mills are taking a little light scrap, the heavier grades are almost without demand. Dealers are not laying down material in their yards, but are buying only for shipping against contracts or on such small orders as are received.

Warehouse Prices, f.o.b. Cincinnati

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
New billet reinforc. bars	3.00c.
Rail steel reinforc. bars	3.00c.
Hoops	3.90c.
Bands	3.20c.
Cold-fin. rounds and hex	3.50c.
Squares	4.00c.
Hot-rolled annealed sheets (No. 24)	3.75c.
Galv. sheets (No. 24)	4.25c.
Hot-rolled sheets (No. 10)	3.30c.
Structural rivets	4.20c.
Small rivets	60 per cent off list
No. 9 ann'l'd wire, per 100 lb	$3.00
Com. wire nails, base per keg (25 kegs or more)	2.95
Cement c't'd nails, base 100-lb. keg	2.95
Chain, per 100 lb	10.25
	Net per 100 Ft.
Seamless steel boiler tubes, 2-in.	$17.50
4-in.	36.00
Lap-welded steel boiler tubes, 2-in.	16.50
4-in.	34.50

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel	$6.75 to	$7.25
Scrap rails for melting	8.50 to	9.00
Loose sheet clippings	3.50 to	4.00
Bundled sheets	5.50 to	6.00
Cast iron borings	3.25 to	3.75
Machine shop turnings	4.00 to	4.50
No. 1 busheling	5.00 to	5.50
No. 2 busheling	3.25 to	3.75
Rails for rolling	9.00 to	9.50
No. 1 locomotive tires	8.50 to	9.00
No. 2 railroad wrought	6.75 to	7.25
Short rails	11.75 to	12.25
Cast iron carwheels	8.25 to	8.75
No. 1 machinery cast	10.00 to	10.50
No. 1 railroad cast	8.75 to	9.25
Burnt cast	4.25 to	4.75
Stove plate	4.25 to	4.75
Brake shoes	4.25 to	4.75
Agricultural malleable	8.00 to	8.50
Railroad malleable	9.00 to	9.50

ST. LOUIS

Stove Makers Active—Pig Iron Prices Firm —Steel Output at Low Ebb

ST. LOUIS, Oct. 13.—While the market for pig iron continues quiet, the tone remains firm, as evidenced by the placing of an order for 500 tons of foundry iron by a local manufacturer with a Southern maker after the buyer had failed in his efforts to get the iron at 50c. less than the market price. Stove manufacturing interests are the most active in buying, and the implement manufacturers in nearby territory have stated that they will resume operations about Nov. 15, and, as their stocks of pig iron are said to be almost exhausted, it is expected that there will be considerable buying from that source. Shipments of the local makers thus far in October are said to be equal to those for the same period last month.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25 f.o.b. Granite City, Ill.	$17.50
Malleable, f.o.b. Granite City	17.50
N'th'n No. 2 fdy., del'd St. Louis	19.66
Southern No. 2 fdy., deliv'd	15.42
Northern malleable, deliv'd	19.66
Northern basic, deliv'd	19.66

Freight rates: 75c. (average) Granite City to St. Louis; $2.16 from Chicago; $4.42 from Birmingham.

FINISHED STEEL

Open-hearth furnaces in the St. Louis district are operating at about 17 per cent of capacity, which is said to be a record low point.

The market for plates, shapes and bars is quiet. While the volume of sheet business is small, the market continues firm, with no price cutting. Railroads are said to be working on programs for 1932, but no inquiries have been issued. Warehouse business is about on a par with that of a month ago, with an improvement from the oil fields needed to bring up the volume.

The only structural award of the week—109 tons for a bridge for the St. Louis-San Francisco Railway at Lindenwood, Mo.—went to the Mississippi Valley Structural Steel Co. The only inquiry is for 105 tons for a bridge at East St. Louis, for the East Side Sanitary Commission.

Warehouse Prices, f.o.b. St. Louis

	Base per Lb.
Plates and struc. shapes	3.25c.
Bars, soft steel or iron	3.00c.
Cold-fin. rounds, shafting, screw stock	3.35c.
Hot-rolled annealed sheets (No. 24)	3.80c.
Galv. sheets (No. 24)	4.35c.
Hot-rolled sheets (No. 10)	3.45c.
Black corrug. sheets (No. 24)	3.85c.
Galv. corrug. sheets	4.40c.
Structural rivets	4.00c.
Boiler rivets	4.00c.
	Per Cent Off List
Tank rivets, 7/8-in. and smaller, 100 lb. or more	65
Less than 100 lb.	60
Machine bolts	73
Carriage bolts	73
Lag screws	73
Hot-pressed nuts, sq., blank or tapped, 200 lb. or more	73
Less than 200 lb.	63
Hot-pressed nuts, hex., blank or tapped, 200 lb. or more	73
Less than 200 lb.	63

OLD MATERIAL

This has been another week of light business in the scrap market. Steel mills are virtually out of the market because of low operations. Dealers, therefore, are buying nothing. Prices are unchanged, with the exception of wrought iron bars and transoms, steel rails, less than 3 ft., and agricultural malleable, which are 50c. a ton less, and railroad malleable, which is 25c. off.

Railroad lists: Chicago, Burlington & Quincy, 8180 tons; Chesapeake & Ohio, 7942 tons; Louisville & Nashville, 5000 tons; Wabash, 1445 tons; New York, Chicago & St. Louis, 32 carloads; and Pullman Co. (St. Louis), 5 carloads.

Dealers' buying prices per gross ton, f.o.b. St. Louis district:

Selected heavy melting steel	$7.75 to	$8.25
No. 1 heavy melting or shoveling steel	$7.25 to	$7.75
No. 2 heavy melting or shoveling steel	7.00 to	7.50
No. 1 locomotive tires	9.00 to	9.50
Misc. stand-sec. rails including frogs, switches and guards, cut apart	8.50 to	9.00
Railroad springs	8.75 to	9.25
Bundled sheets	5.00 to	5.50
No. 2 railroad wrought	7.25 to	7.75
No. 1 busheling	6.00 to	6.50
Cast iron borings and shoveling turnings	5.00 to	5.50
Iron rails	7.00 to	8.00
Rails for rolling	10.50 to	11.00
Machine shop turnings	3.00 to	3.50
Heavy turnings	6.00 to	6.50
Steel car axles	11.50 to	12.00
Iron car axles	15.00 to	15.50
Wrot. iron bars and trans.	5.50 to	6.00
No. 1 railroad wrought	5.00 to	5.50
Steel rails, less than 3 ft.	10.50 to	11.00
Steel angle bars	7.50 to	8.00
Cast iron carwheels	6.75 to	7.25
No. 1 machinery cast	8.00 to	8.50
Railroad malleable	6.00 to	6.25
No. 1 railroad cast	7.50 to	8.00
Stove plate	7.00 to	7.50
Relay. rails, 60 lb. and under	16.00 to	16.50
Relay. rails, 70 lb. and over	20.00 to	21.00
Agricult. malleable	5.50 to	6.00

Receivership Action for National Radiator

Suit has been filed in Federal District Court at Pittsburgh by the reorganization committee of the National Radiator Corpn., Johnstown, Pa., for a receiver. Interest due on a $10,000,000 bond issue, due in 1947, has been defaulted. The corporation has nine plants for the manufacture of radiators and boilers, located at Johnstown and New Castle, Pa., Utica and Dunkirk, N. Y., Trenton, N. J., Framingham, Mass., and Chicago. The reorganization committee, headed by Rudolph B. Flersham, vice-president, Marine Trust Co., Buffalo, has been in charge of the company's affairs since February, 1931.

YOUNGSTOWN

Valley Mills Benefit Slightly from Automobile Orders

YOUNGSTOWN, Oct. 12.—Valley sheet, strip and bar mills benefited by the placing of automobile tonnage last week and, while rolling schedules have not yet been affected, it is indicated that production in the last half of the month will show considerable improvement over that of the first half. New business booked by one large producer in the district in the first third of October shows a gain over the corresponding September period, and there is reason to believe that the improvement will continue. Little change is indicated in demand for steel products other than automotive, although the rate of specifications by manufacturing consumers in the immediate Valley district is fairly well maintained. Makers of steel building products have experienced a seasonal contraction in their manufacturing schedules, but are still taking a fair tonnage from local mills.

Ingot production last week averaged scarcely 25 per cent of capacity, but some improvement is expected this week. To offset this low rate, mills at Massillon were operated on better schedules than they were last month. Pipe mills have practically reached the end of their recent large orders, and activity in electric weld and seamless units will decline rather sharply after the middle of the month unless new orders are placed. There is little inquiry for line pipe, and the possibility of additional tonnage at this time in the year is not great. Sheet and strip production is very intermittent, averaging about 30 and 20 per cent respectively over a fairly long period. Production of sheets has dropped as low as 20 per cent at times during the month, and much of the district's strip activity has been idle. Output of bars is somewhat more steady than that of other products, but is at a very low rate. Production of Bessemer steel has been reduced, following a brief period of activity occasioned by pipe orders.

Valley mills are maintaining a firm attitude on prices. Scarcely any irregularity is reported on current small orders for finished steel. Sheet prices are particularly well held, and concessions on strip steel have been confined to one small producer. The general market continues at 1.55c. and 1.65c. on hot-rolled strip, and 2.15c. on cold-rolled. Wire nail quotations are also stronger than they have been for some time, and current orders are generally bringing 1.90c., Pittsburgh. Manufacturers' wire is holding at 2.20c. Irregularities on the heavy products are confined to reinforcing bars, with the local market on bars and plates well maintained at 1.60c., Pittsburgh.

The pig iron market is very quiet, with shipments this month showing little improvement over those of September. Sales are confined to carloads or lots of about 100 tons. Prices have been weakened by the competition of Lake furnaces, but no decline is indicated. Scrap is considerably weaker, with heavy melting steel quoted at about $10, and hydraulic compressed sheets at least 25c. below that figure.

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BUFFALO

Pig Iron Shipments Larger Than in September, Though Melt Is Low

BUFFALO, Oct. 13.—The Worthington Pump & Machinery Corpn. requires 150 tons of malleable iron for its Harrison, N. J., plant. This seems to be the largest inquiry in the market. Shipments are a little better than for the corresponding time last month. There was a flurry of barge canal shipments last week, but the end of the season is at hand. Foundry melt is believed to be as low as it has ever been in this district.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25	$17.00
No. 2X fdy., sil. 2.25 to 2.75	17.50
No. 1 fdy., sil. 2.75 to 3.25	18.50
Malleable, sil. up to 2.25	17.50
Basic	17.00
Lake Superior charcoal	25.28

FINISHED STEEL

The Lackawanna plant of the Bethlehem Steel Co. continues to operate 11 open-hearths. Republic Steel's open-hearths are idle this week, according to the alternate schedule. Wickwire Spencer has two open-hearths in service. Gould Coupler Works is operating one part time. A new building for the Hecker-Jones Milling Co. will require 400 to 500 tons of reinforcing bars. The sheet outlook is better, as a few inquiries are beginning to come out.

OLD MATERIAL

A sale of 1000 tons of stove plate at about $8.25 is reported. Other sales the past week have been negligible. Several of the railroad lists have been closed, but there is no information here as to where the material went. Scattered sales of No. 1 machinery cast at current quotations are reported.

Warehouse Prices, f.o.b. Buffalo

	Base per Lb.
Plates and struc. shapes	3.25c.
Soft steel bars	3.00c.
Reinforcing bars	2.65c.
Cold-fin. flats and sq.	3.65c.
Rounds and hex.	3.15c.
Cold-rolled strip steel	5.25c.
Hot-rolled annealed sheets (No. 24)	3.70c.
Galv. sheets (No. 24)	4.10c.
Bands	3.35c.
Hoops	3.90c.
Hot-rolled sheets (No. 10)	3.50c.
Com. wire nails, base per keg	$2.45
Black wire, base per 100 lb.	3.20

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades:		
No. 1 heavy melting steel		$9.00
No. 2 heavy melting scrap	7.50 to	8.00
Scrap rails	9.50 to	10.00
Hydraul. comp. sheets		7.50
No. 2 hydraul. comp. sheets		7.00
Hand bundled sheets		7.00
Drop forge flashings		7.50
No. 1 busheling	7.50 to	8.00
Hvy. steel axle turnings	8.00 to	8.50
Machine shop turnings	4.50 to	5.00
No. 1 railroad wrought	7.50 to	8.00
Acid Open-Hearth Grades:		
Knuckles and couplers	10.50 to	11.00
Coil and leaf springs	10.50 to	11.00
Rolled steel wheels	10.50 to	11.00
Low phos. billet and bloom ends	12.50 to	13.00
Electric Furnace Grades:		
Short shov. steel turnings	6.50 to	7.00
Blast Furnace Grades:		
Short mixed borings and turnings	6.00 to	6.50
Cast iron borings	6.00 to	6.50
No. 2 busheling	4.50 to	5.00
Rolling Mill Grades:		
Steel car axles	15.00 to	15.50
Iron axles	16.00 to	16.50
Cupola Grades:		
No. 1 machinery cast	10.00 to	10.50
Stove plate	8.25 to	8.50
Locomotive grate bars	7.00 to	7.50
Steel rails, 3 ft. and under	12.00 to	12.50
Cast iron carwheels	10.50 to	11.00
Malleable Grades:		
Industrial	10.00 to	10.50
Railroad	10.00 to	10.50
Agricultural	10.00 to	10.50
Special Grades:		
Chemical borings	9.00 to	9.50

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Canada

Improvement in Business Not Yet Discernible

TORONTO, Oct. 12.—No indication of early improvement in the Canadian iron and steel industry is yet discernible. With practically all plants operating on reduced schedules and with future business uncertain, demand for raw materials is limited. Pig iron sales continue to be restricted to small lots for immediate needs. Pipe makers are taking the bulk of current foundry iron shipments. Malleable and basic grades are virtually without a market. Early blowing out of one of the three active stacks is anticipated. Prices are unchanged.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75	$22.60
No. 2 fdy., sil. 1.75 to 2.25	22.10
Malleable	22.60
Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75	$24.00
No. 2 fdy., sil. 1.75 to 2.25	23.50
Malleable	24.00
Basic	$23.00 to 23.50

STRUCTURAL STEEL

Activity in this branch of the industry is brisk. While sales in the past week involved mostly small lots, some large orders have been placed recently, and other sizable projects are in prospect. Featuring prospective business is a bridge planned for erection by the Terminal Engineering Co., Ltd., Vancouver, B. C., over the Fraser River at Dease Island, near

Ladner, for which about 3000 tons will be required.

OLD MATERIAL

Demand for scrap is practically at the lowest point for the year. Mills are out of the market, with the result that steel scrap is moving slowly in small lots. Iron grades find little demand, while scattered sales of machinery cast, stove plate and malleable grades are reported. Some export demand exists in the Montreal district, with occasional shipments being made to Europe and the United States. Dealers are out of the market and hold price lists unchanged.

Dealers' buying prices for old material:

Per Gross Ton

	Toronto	Montreal
Heavy melting steel	$7.00	$6.00
Rails, scrap	7.00	6.00
No. 1 wrought	6.00	8.00
Machine shop turnings	2.00	2.00
Boiler plate	5.00	4.50
Heavy axle turnings	2.50	2.50
Cast borings	2.00	2.00
Steel borings	2.00	2.00
Wrought pipe	2.00	2.00
Steel axles	7.00	9.00
Axles, wrought iron	7.00	11.00
No. 1 machinery cast	....	10.00
Stove plate	....	8.00
Standard carwheels	....	8.50
Malleable	....	8.00

Per Net Ton

No. 1 machinery cast	11.00	....
Stove plate	9.00	....
Standard carwheels	10.00	....
Malleable scrap	9.00	....

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BIRMINGHAM

Steel Ingot Production Expands Slightly But Blast Furnaces Curtail

BIRMINGHAM, Oct. 13.—The pig iron market continues to drag and does not even have any hopeful signs. Present buying is still in small lots, and potential requirements for the immediate future are not encouraging. Shipments at the beginning of the month gave indication of an improvement over September, but these have begun to slacken. The quotation of $12 for district tonnage is holding firm. With the outlook still unimproved, further restrictions are being placed on production. Sloss-Sheffield Steel & Iron Co. blew out its No. 1 city furnace on Oct. 9, and now has only one furnace in blast. As previously reported, Republic Steel reduced from two to one on Sept. 25. The Tennessee Coal, Iron & Railroad Co. blew out Fairfield No. 5 on Oct. 6, but this stock is being replaced by Fairfield No. 6, which was lighted on Sept. 28, and the company continues with two active. Woodward Iron, with two furnaces on foundry iron, has not yet made any changes. There are only six active blast furnaces in Alabama, five being on foundry and one on basic.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.	$12.00
No. 1 fdy., 2.25 to 2.75 sil.	12.50
Basic	12.00

FINISHED STEEL

One company reports a gradual improvement in actual orders, as well as in specifications against contracts and in inquiries, while another states that new tonnage is at about the level of the past few weeks. On account of the large cotton crop, additional tonnage is coming in for cotton ties to supplement the pre-season purchases. Birmingham fabricators of structural steel and reinforcing bars booked very little new business last week. The only order of size reported was one for 300 tons of bars secured by the Concrete Steel Co. for State road work in Louisiana. Included in the bar tonnage pending are 500 tons for road work in Louisiana and 3000 tons for the Mississippi River bridge above New Orleans. Open-hearth operations were increased one furnace last week, and there are now eight active. The increase was made by Gulf States Steel, which, after taking off a furnace on Oct. 3, went back to three on Oct. 9. The Tennessee company continues with five in operation at Fairfield.

CAST IRON PIPE

New tonnage last week lapsed back to routine bookings, mostly single carloads. Oakland, Cal., is expected to award this week 1000 tons, on which bids were opened about 10 days ago; the American Cast Iron Pipe Co. was low bidder. This company has booked 250 tons from Hot Springs, S. D. The outlook is promising for winter tonnage from Northern points, as plans are being made to meet the demands for employment. In the South, prospects are very limited, due to lack of finances and the unsatisfactory bond situation. Plant operations continue to range from 30 to 35 per cent.

OLD MATERIAL

There is a fluctuation from week to week in shipments, inquiries and sales, but without any definite upward trend. The market is just about the same as it has been during the past several weeks. Buying is light.

Prices per gross ton deliv'd Birmingham dist. consumers' yards:

Heavy melting steel	$8.50 to $9.00
Scrap steel rails	8.50
Short shoveling turnings	5.50
Cast iron borings	(No market)
Stove plate	6.00
Steel axles	15.00 to 16.00
Iron axles	13.00
No. 1 railroad wrought	8.00
Rails for rolling	10.50 to 11.00
No. 1 cast	9.00
Tramcar wheels	10.00 to 10.25
Cast iron borings, chem.	13.50

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BOSTON

Pig Iron and Scrap Sales Slump—Cast Iron Pipe Prices Soft

BOSTON, Oct. 13.—Following a fortnightly period of slightly increasing pig iron sales, business the past week dropped almost to the vanishing point. The aggregate turnover did not exceed 500 tons, and was confined to Mystic and Indian iron. Indian No. 2X was sold at $19 a ton, on dock here, duty paid. The strike of waterfront workers in Boston has not thus far interrupted unloading of foreign iron. A Rhode Island melter inquiring for 150 to 200 tons of No. 2X and special analysis iron has not covered. There are no other open inquiries in the market.

Foundry iron prices per gross ton deliv'd to most New England points:

*Buffalo, sil. 1.75 to 2.25	$19.91
*Buffalo, sil. 2.25 to 2.75	19.91
†Buffalo, sil. 1.75 to 2.25	19.28
†Buffalo, sil. 2.25 to 2.75	19.28
*Ala., sil. 1.75 to 2.25	$20.11 to 20.61
*Ala., sil. 2.25 to 2.75	20.61 to 21.11
†Ala., sil. 1.75 to 2.25	16.75
†Ala., sil. 2.25 to 2.75	17.25

Freight rates: $4.91 all rail and $4.28 rail and water from Buffalo; $9.61 all rail from Alabama and $5.75 rail and water from Alabama to New England seaboard.

*All rail rate.

†Rail and water rate.

CAST IRON PIPE

Massachusetts has awarded 350 tons of pipe to the Warren Pipe Co. of New England for a State institution, and Portland, Me., awarded 5000 ft. of 8-in. to the same company. The United States Pipe & Foundry Co. was awarded the 7000 ft. of 8-in. required by Groton, Conn. Otherwise business the past week was in small tonnages, of which 40 tons of 6-in. for West Springfield, Mass., to the Donaldson Iron Co. was the largest. The market for pit cast pipe is now down to around $28 a ton, base, foundry,

Warehouse Prices, f.o.b. Boston

	Base per Lb
Plates	*3.35c.
Structural shapes—	
Angles and beams	*3.35c.
Tees	*3.35c.
Zees	*3.35c.
Soft steel bars, small shapes	*3.25c.
Reinforcing bars	3.10c. to 3.25c.
Iron bars—	
Refined	3.25c.
Best refined	4.60c.
Norway rounds	6.60c.
Norway squares and flats	7.10c.
Spring steel—	
Open-hearth	5.00c.
Crucible	12.00c.
Tire steel	4.50c. to 4.75c.
Bands	*3.75c. to 4.25c.
Hoop steel	4.90c. to 5.40c.
Cold-rolled steel—	
Rounds and hex	3.50c. to 5.50c.
Squares and flats	4.00c. to 6.00c.
Toe calk steel	6.00c.
Rivets, structural or boiler	4.80c.

	Per Cent Off List
Machine bolts	65 and 5
Carriage bolts	65 and 5
Lag screws	65 and 5
Hot-pressed nuts	40 and 10
Cold-punched nuts	40 and 10
Stove bolts	70 and 10

*Base price (250 to 999 lb.); less than 250 lb., add 50c. per 100 lb.; 1000 to 7999 lb., deduct 15c.; 8000 to 14,999 lb., deduct 25c.; 15,000 lb. and larger lots, deduct 35c.

price depends to a considerable extent on the quantity and sizes involved.

OLD MATERIAL

The American Steel & Wire Co., Worcester, Mass., has bought little No. 1 heavy melting steel. Foundry buying of machinery cast has been a shade better of late.

Buying prices per gross ton, f.o.b. Boston area shipping points:

No. 1 heavy melting steel..	$4.10 to	$4.60
Scrap T rails	4.10 to	4.60
Scrap girder rails	3.10 to	3.60
No. 1 railroad wrought...	4.50 to	5.00
Machine shop turnings....	1.25 to	2.10
Cast iron borings (steel works and rolling mill)	1.50 to	1.75
Bundled skeleton, long....	3.00 to	3.25
Forge flashings	3.00 to	3.50
Blast furnace borings and turnings	0.85 to	1.25
Forged scrap	2.00 to	2.50
Shafting	10.00 to	10.50
Steel car axles.....	11.00 to	12.00
Wrought pipe, 1 in. in diameter (over 2 ft. long)	4.00 to	4.25
Rails for rolling.....	8.50 to	9.00
Cast iron borings, chemical	7.00 to	7.25
No. 2 cast	4.85 to	5.00

Prices per gross ton deliv'd consumers' yards:

Textile cast	$9.50 to	$10.00
No. 1 machinery cast.....	9.50 to	10.00
Stove plate	5.00 to	5.25
Railroad malleable.....	10.50 to	11.00

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PACIFIC COAST

SAN FRANCISCO, Oct. 12.—Department of Commerce figures just released which summarize the tonnage of steel brought in from foreign countries through Pacific Coast ports during August indicate that 1300 tons of merchant bars was received, or 30 per cent of the entire nation's imports for the month. In addition, 712 tons of structural shapes was imported, or 13 per cent of the nation's total.

BARS

Reported awards on larger tonnages for the week total 960 tons, with new inquiries for 736 tons. More than 2000 tons is involved in California State highway projects now pending.

CAST IRON PIPE

United States Cast Iron Pipe Co. was low on 1364 tons for Long Beach, the only important project of the week. Projects on which bids were opened total 1545 tons, with new inquiries for 700 tons.

PLATES

Projects involving 1800 tons are definitely pending for award during the next 15 days, the largest of which is a siphon for the Hetch Hetchy water development. Bids will be received Oct. 23 on 750 tons. Long Beach is planning for immediate construction of six A. P. I. standard steel tanks, each 132 ft. in diameter.

RAILWAY SUPPLIES

Hofius Steel & Equipment Co., Portland, will supply 855 tons of 75-lb. relaying rails for a jetty project at Astoria, Ore. The Pacific Coast Steel Co. was awarded 500 tons of 7-in., 82-lb. girder rails for the Seattle municipal street railways. United Commercial Co., Los Angeles, is furnishing relaying rails and accessories for eight miles of additional trackage to the Six Companies, Inc., for Hoover Dam construction.

STEEL PIPE

Standard Oil Co. of California announces the immediate construction of a $500,000 pipe line from Kettleman Hills field to the marine terminal at Estero Bay, but it is understood that this is largely a labor project to enable the company to hold its field force, and that little, if any, new pipe will be purchased.

STRUCTURAL SHAPES

Announced awards on major projects for the week total more than 1600 tons, with new inquiries for 820 tons. Excluding two post offices, practically every project placed or pending is for bridge construction.

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Foreign Steel Receipts Large—Bars 30 Per Cent of Nation's Total

F.O.B. Warehouse Prices

(Less than 5000 Lb.)

	Base per Lb.		
	San Francisco	Los Angeles	Seattle
Plates and struc. shapes, ¼-in. and heavier	2.80c.	2.00c.	2.25c.
Soft steel bars....	2.80c.	3.00c.	2.25c.
Reinforcing bars...	2.80c.	2.80c.	3.00c
Hot-rolled annealed sheets (No 24)..	3.90c.	4.00c.	3.50c.
Hot-rolled sheets (No. 10).....	3.40c.	3.50c.	3.00c.
Galv. sheets (No. 24)	4.40c.	4.20c.	4.00c.
Struc. rivets, ½ in. and larger, less than 1000 lb.....	5.00c.	5.00c.	5.50c.
Special nails: common 4 to 60d; smooth box 4 to 20d; finish 6 and 8d; base per keg	$2.55	$2.45	$2.40
Other wire nails, base per keg....	2.80	2.70	2.65
Cement c't'd nails, 100-lb. keg.....	2.65	2.70	2.65

Reinforcing Steel

New Inquiries Heavier—Awards Decline Slightly

NEW projects requiring reinforcing steel total 4800 tons, compared with 2250 tons a week ago. The largest new job is a bridge at Milwaukee which will require 850 tons. Awards, at 4400 tons, compare with 5100 tons in the previous week. Bookings include 900 tons for the Department of Justice Building at Washington, 500 tons for a bridge at Chicago and 500 tons for Marquette University at Milwaukee. Awards follow:

PHILADELPHIA, 200 tons, additions to Richmond power plant, awarded by United Engineers & Constructors to Kalman Steel Co.

ST. NICHOLAS, PA., 300 tons, foundations for coal breaker for Philadelphia & Reading Coal & Iron Co., to Kalman Steel Co.

NEW YORK CENTRAL RAILROAD, 250 tons, sewer between Tenth and Eleventh Avenues, New York, awarded by Remo Engineering Corpn. to National Bridge Co.

WASHINGTON, 850 to 900 tons, foundation and precast concrete piles, Department of Justice Building, to Kalman Steel Co.

EVANSTON, ILL., 100 tons, Deering library for Northwestern University, to Concrete Steel Co.

CHICAGO, 500 tons, Harlem Avenue bridge, to Concrete Engineering Co.

CHICAGO, 240 tons, Richter Food Products Co., to Calumet Steel Co.

CHICAGO, 200 tons, Outer Drive, to Concrete Steel Co.

CHICAGO, 150 tons, Dvorak Junior High School, to Concrete Engineering Co.

MILWAUKEE, 500 tons, Marquette University, to Concrete Steel Co.

MILWAUKEE, 390 tons, Whitefish Bay High School, to Olney J. Dean & Co.

STATE OF LOUISIANA, 300 tons, road work, to Concrete Steel Co.

SAN FRANCISCO, 300 tons, Third Street bridge, to Pacific Coast Steel Co.

PORTLAND, ORE., 100 tons, Emanuel Hospital, to Soule Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

NEW YORK, 200 tons, parcel post building; sub-contract for foundation work awarded by George F. Driscoll, Brooklyn, to Corbetta Concrete Co.

NEW YORK, 200 tons, garbage disposal plant on East 150th Street.

PHILADELPHIA, 150 tons, foundations for new post office.

PHILADELPHIA, unstated tonnage, building for Consolidated Cigar Corpn.; formerly structural steel but redesigned for reinforced concrete.

BUFFALO, N. Y., 400 to 500 tons, building for Hecker-Jones Milling Co.

LOUISVILLE, KY., 210 tons, Montana Avenue sewer, section B, contract No. 61; bids to be opened Oct. 27.

STATE OF LOUISIANA, 500 tons, road work.

NEW ORLEANS, 3000 tons, Public Belt Railway bridge over Mississippi River; previously reported as 1500 tons.

ALMA, WIS., 300 tons, Lock No. 4 on Mississippi River.

MILWAUKEE, 850 tons, bridge.

ELGIN, ILL., 100 tons, public school.

SANTA BARBARA COUNTY, CAL., 320 tons, Los Alamos Highway bridges.

SAN BENITO COUNTY, CAL., 170 tons, San Juan Highway bridges.

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Following the consolidation of the Advance-Rumely Thresher Co. with the Allis-Chalmers Mfg. Co., Milwaukee, H. C. Merritt, general manager, tractor division, Allis-Chalmers company, has announced the removal of headquarters for track type and industrial tractor sales from Springfield, Ill., to the main tractor offices at Milwaukee.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

MILL PRICES OF SEMI-FINISHED STEEL

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and under 10-in., Pittsburgh	$29.00
Rerolling, 4-in. and under 10-in., Youngstown	29.00
Rerolling, 4-in. and under 10-in., Cleveland	29.00
Rerolling, 4-in. and under 10-in., Chicago	31.00
Forging quality, Pittsburgh	35.00

Sheet Bars

(Open-Hearth or Bessemer)

	Per Gross Ton
Pittsburgh	$29.00
Youngstown	29.00
Cleveland	29.00

Slabs

(8 in. x 2 in. and under 10 in. x 10 in.)

	Per Gross Ton
Pittsburgh	$29.00
Youngstown	29.00
Cleveland	29.00

Skelp

(F.o.b. Pittsburgh or Youngstown)

	Per Lb.
Grooved	1.60c.
Universal	1.60c.
Sheared	1.60c.

Wire Rods

(Common soft, base)

	Per Gross Ton
Pittsburgh	$35.00
Cleveland	35.00
Chicago	36.00

PRICES OF RAW MATERIAL

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron	$4.80
Old range non-Bessemer, 51.50% iron	4.65
Mesabi Bessemer, 51.50% iron	4.65
Mesabi non-Bessemer, 51.50% iron	4.50
High phosphorus, 51.50% iron	4.40

Foreign Ore, c.i.f. Philadelphia or Baltimore

	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron, dry, Spanish or Algerian	8c. to 9c.
Iron ore, low phos., Swedish, average 68% iron	10.00c.
Iron ore, basic or foundry, Swedish, average 65% iron	9.00c.
Iron ore, basic and foundry, Russian, average 63% iron	9.00c.
Manganese ore, washed 52% manganese, from the Caucasus	25c. to 26c.
Manganese ore, African or Indian, 50 to 52%	23c. to 24c.
Manganese ore, Brazilian, 46 to 48%	22c. to 23c.
Tungsten ore, high grade, per unit, in 60% concentrates	$12.00 to $12.50
	Per Gross Ton
Chrome ore, 45% Cr_2O_3 crude, c.i.f. Atlantic seaboard	$20.00
Chrome ore, 48% Cr_2O_3, c.i.f. Atlantic seaboard	22.50

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	$2.40
Foundry, f.o.b. Connellsville prompt	$3.25 to 4.50
Foundry, by-product, Ch'go ovens	7.50
Foundry, by-product, New England, del'd	10.50
Foundry, by-product, Newark or Jersey City, delivered	8.70 to 9.10
Foundry, by-product, Phila.	9.00
Foundry, Birmingham	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry, by-product, del'd St. Louis	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	$1.40 to $1.50
Mine run coking coal, f.o.b. W. Pa.	1.50 to 1.60
Gas coal, 3-in., f.o.b. Pa. mines	1.70 to 1.80
Mine run gas coal, f.o.b. Pa. mines	1.50 to 1.60
Steam slack, f.o.b. W. Pa. mines	.60 to .75
Gas slack, f.o.b. W. Pa. mines	.60 to .75

Ferromanganese

	Per Gross Ton
Domestic, 80%, seaboard	*$80.00 to $85.00
Foreign, 80%, Atlantic or gulf port, duty paid	*80.00 to 85.00

*Minimum price quoted for lots of 2000 tons or more.

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%	$28.00 to $30.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	$83.50
75%	130.00

Per Gross Ton Furnace		*Per Gross Ton Furnace*	
10%	$35.00	12%	$39.00
11%	37.00	14 to 16%	31.00

Bessemer Ferrosilicon

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
10%	$25.00	13%	$29.00
11%	26.00	14%	31.00
12%	27.00	15%	33.00

Silvery Iron

F.o.b. Jackson County, Ohio, Furnace

Per Gross Ton		*Per Gross Ton*	
6%	$20.00	11%	$23.00
7%	20.50	12%	24.00
8%	21.00	13%	26.00
9%	21.50	14%	28.00
10%	22.00	15%	30.00

Other Ferroalloys

Ferrotungsten, per lb. contained metal del'd, carloads	$1.08
Ferrotungsten, less carloads	$1.15 to 1.25
Ferrochromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads	11.00c.
Ferrochromium, 2% carbon	17.00c. to 17.50c.
Ferrochromium, 1% carbon	19.00c. to 20.00c.
Ferrochromium, 0.10% carbon	24.50c. to 26.00c.
Ferrochromium, 0.06% carbon	26.50c. to 28.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace	$3.15 to $3.65
Ferrocarbontitanium, 15 to 18%, per net ton, f.o.b. furnace, in carloads	$160.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18%, Rockdale, Tenn., base per gross ton	91.00
Ferromolybdenum, per lb. contained Mo., delivered	1.00
Calcium molybdate, per lb. contained Mo., delivered	85c.
Ferrophosphorus, electric, 24%, f.o.b. Anniston, Ala., per gross ton	$122.50
Silico spiegel, per ton, f.o.b. furnace, car lots	42.50
Ton lots or less, per ton	47.50
Silico-manganese, gross ton, delivered: 2.50% carbon grade	105.00
1% carbon grade	115.00
Spot prices	$5 a ton higher

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silicon, gravel, f.o.b. Illinois and Kentucky mines	$13.00
No. 2 lump, Illinois and Kentucky mines	17.00
Foreign, 85% calcium fluoride, not over 5% silicon, c.i.f. Atlantic port, duty paid	17.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silicon, f.o.b. Illinois and Kentucky mines	32.00

Fire Clay Brick

	Per 1000 f.o.b. Works High-Heat Duty Brick	Intermediate Heavy Duty Brick
Pennsylvania	$40.00	$32.00 to $35.00
Maryland	40.00	32.00 to 35.00
New Jersey	$44.00 to 59.00	.....
Ohio	40.00	32.00 to 35.00
Kentucky	40.00	32.00 to 35.00
Missouri	37.00	32.00 to 35.00
Illinois	40.00	32.00 to 35.00
Ground fire clay, per ton	6.50	

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	$40.00
Chicago	49.00
Birmingham	50.00
Silica clay, per ton	8.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.	$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.	40.00

Chrome Brick

	Per Net Ton
Standard size	$45.00

MILL PRICES OF BOLTS, NUTS, RIVETS AND SET SCREWS

Bolts and Nuts

(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

	Per Cent Off List
†Machine bolts	73 and 10
†Carriage bolts	73 and 10
Lag bolts	73 and 10
Plow bolts, Nos. 1, 2, 3 and 7 heads	73 and 10
Hot-pressed nuts, blank or tapped, square	73 and 10
Hot-pressed nuts, blank or tapped, hexagons	73 and 10
C.p.c. and t. square or hex. nuts, blank or tapped	73 and 10
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
†Bolts with rolled thread up to and including ⅞ in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagons nuts	73 and 10
Semi-finished hexagons castellated nuts, S.A.E.	73 and 10
Stove bolts in packages, P'gh.	80, 10, 10, 10 and 5
Stove bolts in packages, Ch'go.	80, 10, 10, 10 and 5
Stove bolts in pkgs., Cleveland	80, 10, 10, 10 and 5
Stove bolts in bulk, P'gh.	80, 10, 10, 10, 5 and 2½
Stove bolts in bulk, Ch'go.	80, 10, 10, 10, 5 and 2½
Stove bolts in bulk, Cleveland	80, 10, 10, 10, 5 and 2½
Tire bolts	60, 10 and 10

Discounts of 73 and 10 per cent off on bolts and nuts apply on carload business with jobbers and large consumers.

Large Rivets

(½-in. and larger)

	Base per 100 Lb.
F.o.b. Pittsburgh or Cleveland	$2.25
F.o.b. Chicago	2.35

Small Rivets

(⅞-in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh	70, 10 and 5
F.o.b. Cleveland	70, 10 and 5
F.o.b. Chicago	70, 10 and 5

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)

	Per Cent Off List
Milled cap screws	80, 10, 10 and 5
Milled standard set screws, case hardened	80 and 5
Milled headless set screws, cut thread	75 and 10
Upset hex. head cap screws, U.S.S.S. thread	85 and 10
Upset hex. cap screws, S.A.E. thread	85 and 10
Upset set screws	80, 10 and 5
Milled studs	70

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel	*Base per Lb.*
Pittsburgh mill	1.60c.
Chicago	1.70c.
Philadelphia	1.89c.
New York	1.93c.
Cleveland	1.65c.
Lackawanna	1.70c.
Birmingham	1.70c.
Pacific ports	2.00c.
Billet Steel Reinforcing	
High mills, 40, 50, 60-ft.	1.60c.
Birmingham, mill lengths	1.75c.
Cleveland	1.55c. to 1.60c.
Rail Steel	
Mills, east of Chicago dist.	1.30c. to 1.35c.
Chicago Heights mill	1.50c. to 1.60c.
Philadelphia	1.49c. to 1.59c.
Iron	
Common iron, f.o.b. Chicago	1.70c.
Refined iron, f.o.b. P'gh mills	2.75c.
Common iron, del'd Philadelphia	2.09c.
Common iron, del'd New York	2.14c.

Tank Plates

	Base per Lb.
Pittsburgh mill	1.60c.
Chicago	1.70c.
Birmingham	1.70c.
Cleveland	1.78½c.
Philadelphia	1.80½c.
Coatesville	1.70c.
Sparrows Point	1.70c.
Lackawanna	1.70c.
New York	1.88c.
Pacific ports	1.85c. to 1.90c.

Structural Shapes

	Base per Lb.
Pittsburgh mill	1.60c.
Chicago	1.70c.
Birmingham	1.70c.
Lackawanna	1.70c.
Bethlehem	1.70c.
Cleveland	1.78½c.
Philadelphia	1.71c. to 1.76c.
New York	1.85½c.
Pacific ports	2.05c.

Hot-Rolled Hoops, Bands and Strips

	Base per Lb.
6 in. and narrower, Pittsburgh	1.65c.
Wider than 6 in., P'gh	1.55c.
6 in. and narrower, Chicago	1.75c.
Wider than 6 in., Chicago	1.65c.
Cooperage stock, P'gh	1.75c. to 1.85c.
Cooperage stock, Chicago	1.85c. to 1.95c.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill	2.10c.
Bars, f.o.b. Chicago	2.10c.
Bars, Cleveland	2.10c.
Bars, Buffalo	2.10c.
Shafting, ground, f.o.b. mill	*2.45c. to 3.40c.
Strips, P'gh	2.15c. to 2.25c.
Strips, Cleveland	2.15c. to 2.25c.
Strips, deliv'd Chicago	2.43c. to 2.53c.
Strips, Worcester	2.30c.
Fender stock, No. 20 gage, Pittsburgh or Cleveland	3.20c.

*According to size.

Wire Products

(Carload lots, f.o.b. Pittsburgh and Cleveland)

To Manufacturing Trade	
Bright wire	2.20c.
Spring wire	3.20c.
To Jobbing Trade	*Base per Keg*
Standard wire nails	$1.90
Smooth coated nails	1.90
Galvanized nails	3.90
	Base per Lb.
Smooth annealed wire	2.35c.
Smooth galvanized wire	2.80c.
Polished staples	2.35c.
Galvanized staples	2.60c.
Barbed wire, galvanized	2.55c.
Woven wire fence, Nos. 9 and 11 gage, per net ton	$55.00
Woven wire fence, No. 12½ gage and lighter, per net ton	60.00
To Retail Trade	*Base per Keg*
Standard wire nails	$2.00
Cement coated nails	2.00
Galvanized nails	4.00
	Base per Lb.
Smooth annealed wire	2.45c.
Smooth galvanized wire	2.90c.
	Base per Lb.
Polished staples	2.45c.
Galvanized staples	2.70c.
Barbed wire, galvanized	2.65c.
Woven wire fence, Nos. 9 and 11 gage, per net ton	$60.00
Woven wire fence, 12½ gage and lighter, per net ton	65.00

Anderson, Ind., mill prices are ordinarily $1 a ton over Pittsburgh base; Duluth, Minn., and Worcester, Mass., mill $2 a ton over Pittsburgh, and Birmingham mill $3 a ton over Pittsburgh.

Sheets

Hot-Rolled	*Base per Lb.*
No. 10, f.o.b. Pittsburgh	1.70c.
No. 10, f.o.b. Chicago mills	1.80c.
No. 10, del'd Philadelphia	1.99c.
No. 10, f.o.b. Birmingham	1.85c.
No. 10, c.i.f. Pacific Coast ports	2.33c.
Hot-Rolled and Annealed	
No. 10, Pittsburgh	1.85c.
No. 10, Chicago mills	1.95c.
No. 10, Birmingham	2.00c.
Hot-Rolled Annealed	
No. 24, f.o.b. Pittsburgh	2.40c.
No. 24, f.o.b. Chicago mills	2.50c.
No. 24, del'd Philadelphia	2.69c.
No. 24, f.o.b. Birmingham	2.55c.
No. 24, c.i.f. Pacific Coast ports	2.88c.
Heavy Cold-Rolled	
No. 10 gage, f.o.b. Pittsburgh	2.35c.
No. 10 gage, f.o.b. Chicago mills	2.45c.
No. 10 gage, del'd Philadelphia	2.64c.
No. 10 gage, f.o.b. Birmingham	2.50c.
Light Cold-Rolled	
No. 20 gage, f.o.b. Pittsburgh	2.95c.
No. 20 gage, f.o.b. Chicago mills	3.05c.
No. 20 gage, del'd Philadelphia	3.24c.
No. 20, f.o.b. Birmingham	3.10c.
Automobile Body Sheets	
No. 20, f.o.b. Pittsburgh	3.10c.
Steel Furniture Sheets	
No. 10, f.o.b. Pittsburgh	2.75c.
No. 20, f.o.b. Pittsburgh	3.35c.

(Prices on furniture stock include stretcher leveling but not resquaring.)

Galvanized Sheets	
No. 24, f.o.b. Pittsburgh	2.90c.
No. 24, f.o.b. Chicago mills	3.00c.
No. 24, del'd Philadelphia	3.19c.
No. 24, f.o.b. Birmingham	3.05c.
No. 24, c.i.f. Pacific Coast ports	3.38c.
Long Ternes	
No. 24, unassorted, 8-lb. coating, f.o.b. P'gh	3.15c.
Vitreous Enameling Stock	
No. 10, f.o.b. Pittsburgh	2.90c.
No. 20, f.o.b. Pittsburgh	3.40c.
Tin Mill Black Plate	
No. 28, f.o.b. Pittsburgh	2.65c.
No. 28, Chicago mills	2.75c.

Tin Plate

	Base per Box
Standard cokes, f.o.b. P'gh district mills	$4.75
Standard cokes, f.o.b. Gary	4.85

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C.	$10.30
15-lb. coating I.C.	12.90
20-lb. coating I.C.	14.00
25-lb. coating I.C.	$15.20
30-lb. coating I.C.	16.00
40-lb. coating I.C.	17.80

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quantity Bar Base, 2.65c. per Lb.

S.A.E. Series Numbers		Alloy Differential per 100 Lb.
2000	(½% Nickel)	$0.25
2100	(1½% Nickel)	0.55
2300	(3½% Nickel)	1.50
2500	(5% Nickel)	2.25
3100	Nickel Chromium	0.55
3200	Nickel Chromium	1.35
3300	Nickel Chromium	3.80
3400	Nickel Chromium	3.20
4100	Chromium Molybdenum (0.15 to 0.25 Molybdenum)	0.50
4100	Chromium Molybdenum (0.25 to 0.40 Molybdenum)	0.70
4600	Nickel Molybdenum (0.20 to 0.30 Molybdenum (1.25 to 1.75 Nickel)	1.05
5100	Chromium Steel (0.60 to 0.90 Chromium)	0.35
5100	Chromium Steel (0.80 to 1.10 Chromium)	0.45
5100	Chromium Spring Steel	0.20
6100	Chromium Vanadium Bar	1.20
6100	Chromium Vanadium Spring Steel	0.95
9250	Silicon Manganese Spring Steel (flats)	0.25
	Rounds and squares	0.50
	Chromium Nickel Vanadium	1.50
	Carbon Vanadium	0.95

Above prices are for hot-rolled steel bars, forging quality. The differential for cold-drawn bars is ¾c. a lb. higher, with standard classification for cold-finished alloy steel bars applying. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis.

Billets under 4 x 4 in. carry the steel bar base. Slabs with a sectional area of 16 in. or over carry the billet price. Slabs with sectional area of less than 16 in. or less than 2½ in. thick, regardless of sectional area, take the bar price.

Rails

	Per Gross Ton
Standard, f.o.b. mill	$43.00
Light (from billets), f.o.b. mill	34.00
Light (from rail steel), f.o.b. mill	32.00

Track Equipment

	Base per 100 Lb.
Spikes, ⅞ in. and larger	$2.70
Spikes, ½ in. and larger	2.70
Spikes, boat and barge	2.90
Tie plate, steel	1.95
Angle bars	2.75
Track bolts, to steam railroads	$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count	73 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Steel Inches	Steel Black	Steel Galv.	Iron Inches	Iron Black	Iron Galv.
⅛	47	21½	¼ and ⅜	+11	+36
¼ to ⅜	53	27½	½	23	5
½	58	44½	¾	28	11
¾	62	50½	1 and 1¼	31	15
1 to 3	64	52½	1½ and 2	35	18
Lap Weld					
2	57	45½	2	23	9
2½ to 6	61	49½	2½ to 3½	28	13
7 and 8	58	45½	4 to 6	30	17
9 and 10	56	43½	7 and 8	29	16
11 and 12	55	42½	9 to 12	26	11
Butt Weld, extra strong, plain ends					
⅛	43	26½	¼ and ⅜	+13	+48
¼ to ⅜	49	32½	½	23	7
½	55	44½	¾	28	12
¾	60	49½	1 to 2	34	18
1 to 1½	62	51½			
2 to 3	63	52½			
Lap Weld, extra strong, plain ends					
2	55	44½	2	29	13
2½ to 4	59	48½	2½ to 4	34	20
4½ to 6	58	47½	4½ to 6	33	19
7 to 8	54	41½	7 and 8	31	17
9 and 10	47	34½	9 to 12	21	8
11 and 12	46	33½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discounts of 5 and 2½%, and on galvanized by 1½ points with supplementary discounts of 5 and 2½%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note.—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Steel		Charcoal Iron	
2 in. and 2¼ in.	38	1½ in.	1
2½ in.—2¾ in.	46	1¾ in.	8
3 in.	52	2 in.—2¼ in.	13
3¼ in.—3¾ in.	54	2 in.—2¼ in.	13
4 in.	57	3 in.	17
4½ in. to 6 in.	46	3¼ in. to 3½ in.	18
		4 in.	20
		4½ in.	21

On lots of a carload or more, the above base discounts are subject to a preferential of two fives on steel and of 10 per cent on charcoal iron tubes. Smaller quantities are subject to the following modifications from the base discounts:

Lap Welded Steel—Under 10,000 lb., 6 points under base and one five; 10,000 lb. to carload, 4 points under base and two fives. Charcoal Iron—Under 10,000 lb., 2 points under base; 10,000 lb. to carload, base and one five.

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	61	3 in.	46
1¼ to 1½ in.	53	3¼ to 3½ in.	48
1¾ in.	37	4 in.	51
2 to 2¼ in.	32	4½, 5 and 6 in.	40
2½ to 2¾ in.	40		
Hot Rolled			
2 and 2¼ in.	38	3¼ to 3½ in.	54
2½ and 2¾ in.	46	4 in.	57
3 in.	52	4½, 5 and 6 in.	46

Beyond the above base discounts a preferential discount of 5 per cent is allowed on carload lots. On less than carloads to 10,000 lb., base discounts are reduced 4 points with 5 per cent preferential; on less than 10,000 lb., base discounts are reduced 6 points, with no preferential. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gages take the mechanical tube list and discounts. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

	Per Cent Off List
Carbon, 0.10% to 0.30% base (carloads)	55
Carbon, 0.30% to 0.40% base	50

Plus differential for lengths over 18 ft. and for commercial exact lengths. Warehouse discounts on small lots are less than the above.

▲▲▲ Non-Ferrous Metal Markets ▲▲▲

Copper Fairly Active—Tin Price Stronger—Zinc Drops Further

NEW YORK, Oct. 13.

COPPER

Domestic buyers of electrolytic copper have been moderately active, placing some business for prompt shipment and a fair tonnage for first quarter delivery at 7c. a lb., delivered Connecticut valley. While a minor tonnage of copper has been bought for second quarter, sellers have been generally unwilling to go beyond April for future business. Reports that copper had been sold at 6.75c. a lb., delivered, during the week, were evidently without foundation, as all custom smelters are maintaining the 7c., delivered, price. Lake copper has been slightly more active in the past week, with small orders placed for prompt shipment, and the price is unchanged at 7.37½c., delivered.

Export sales of copper for the month total 7500 tons to Oct. 12, and at this rate, October is expected to compare favorably with previous months in the total of foreign business. Copper Exporters, Inc., continues to quote 7.50c. a lb., c.i.f. usual European ports. Representatives of foreign copper-producing interests have sailed for New York to attend the international conference scheduled for the end of this month to discuss the problem of world over-production of copper.

TIN

The market here was inactive on Oct. 7 and 8, but developed strength on Oct. 9, in sympathy with an advance in London, resulting from group support of spot standard tin. This movement in the London market narrowed what had previously been a rather wide margin between the spot and future standard prices. The market here advanced to 22.87½c. a lb. on Oct. 9, stimulated by both consumer and speculative buying. Today's quotations in London are £130 5s. for spot standard, £132 5s. for future standard, £134 5s. for spot Straits and £135 5s. a ton for shipments from Singapore. United Kingdom stocks have registered a decline of 414 tons to a total of 29,725 tons. Shipments of tin from the Straits to Oct. 10 were 3130 tons, which slightly exceeds expectations

LEAD

Following the decline in lead prices a week ago, when there was a difference of but 2 points between the cost of the domestic product and foreign lead, duty paid, New York, domestic consumers have been small buyers.

THE WEEK'S PRICES, CENTS PER POUND FOR EARLY DELIVERY

	Oct. 13	Oct. 10	Oct. 9	Oct. 8	Oct. 7
Lake copper, New York	7.37½	7.37½	7.37½	7.37½	7.37½
Electrolytic copper, N. Y.*	6.75	6.75	6.75	6.75	6.75
Straits tin, spot, N. Y.	23.12½	....	22.87½	22.25	22.25
Zinc, East St. Louis	3.45	3.50	3.50	3.50	3.57½
Zinc, New York	3.80	3.85	3.85	3.85	3.92½
Lead, St. Louis	3.82½	3.82½	3.82½	3.82½	3.85
Lead, New York	4.00	4.00	4.00	4.00	4.00

*Refinery quotation; price ½c. higher delivered in the Connecticut Valley.

Aluminum, 98 to 99 per cent pure, 22.90c. a lb., delivered.
Nickel electrolytic cathode, 35c. a lb., delivered; shot and ingot, 36c. a lb., delivered.
Antimony, 6.50c. to 6.55c. a lb., New York.

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With the current lead quotation at 4c., New York, and 3.82½c., St. Louis, the difference between foreign and domestic lead at New York is now 49 points. But little metal has been bought for November delivery, consumers contenting themselves with buying small lots for their immediate requirements.

ZINC

Prices have declined a total of 12½ points in the past week, sales on Oct. 8 bringing a drop of 7½ points to 3.50c., East St. Louis, and 3.85c., New York, and additional weakness today, causing a further decline of 5 points to 3.45c., East St. Louis, and 3.80c., New York. Total sales for September were about 1000 tons under the August total, and, with consumers buying only small lots for prompt shipment, improvement is not yet evident for October.

ANTIMONY

The Chinese metal is quoted by importers at 6.50c. to 6.55c., duty paid, New York, for prompt shipment, the higher price applying only on the smallest orders. Quotations from China for future delivery have not been obtained in the past week, sellers there reporting uncertainty because of Chinese-Japanese relations.

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McInerney Spring & Wire Co., headed by J. L. McInerney, has been formed, according to an announcement by the Grand Rapids Association of Commerce, Grand Rapids, Mich. The new company has acquired the machinery, equipment and materials of the National Marshall Spring Corpn., and will manufacture automobile and furniture seating springs.

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Republic Steel Corpn. has ordered three 300-hp. adjustable speed motors and control apparatus to furnish the drive for rolling cold strip in the tandem mill at its Massillon, Ohio, works, from the Westinghouse Electric & Mfg. Co., East Pittsburgh.

New York, Chicago or Cleveland Warehouse

Delivered Prices, Base per Lb.

High brass	15.00c.
*Copper, hot rolled, base sizes, 1000 lb. and more	16.12½c.
Seamless Tubes—	
Brass	16.25c.
Copper	15.62½c.
Brass Rods	11.25c.
Brazed Brass Tubes	21.50c.

*Extra for cold-rolled, 3c. per lb.

New York Warehouse

Delivered Prices, Base per Lb.

Zinc sheets (No. 9), casks	9.25c. to 9.50c.
Zinc sheets, open	10.25c. to 10.50c.

Metals from New York Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	25.00c. to 26.00c.
Tin, bar	27.00c. to 29.00c.
Copper, Lake	9.00c. to 10.00c.
Copper, electrolytic	8.50c. to 9.00c.
Copper, casting	8.25c. to 8.75c.
Zinc, slab	5.00c. to 5.50c.
Lead, American pig	5.00c. to 6.00c.
Lead, bar	6.75c. to 7.75c.
Antimony, Asiatic	9.00c. to 10.00c.
Aluminum No. 1 ingots for remelting (guaranteed over 99% pure)	20.00c. to 23.00c.
Alum. ingots, No. 12 alloy	19.00c. to 21.00c.
Babbitt metal, commercial grade	19.00c. to 29.00c.
Solder, ½ and ½	16.50c. to 17.50c.

Metals from Cleveland Warehouse

Delivered Prices, per Lb.

Tin, Straits pig	27.00c.
Tin, bar	29.00c.
Copper, Lake	8.37½c.
Copper, electrolytic	8.37½c.
Copper, castings	8.00c.
Zinc, slab	5.00c.
Lead, American pig	4.75c.
Lead, bar	4.75c.
Antimony, Asiatic	10.00c.
Babbitt metal, medium grade	15.00c.
Babbitt metal, high grade	31.00c.
Solder, ½ and ½	19.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged consumers after the metal has been properly prepared for their uses. (All prices are nominal because of uncertain condition of market.)

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible	5.25c.	6.00c.
Copper, hvy. and wire	5.00c.	5.75c.
Copper, light and bottoms	4.25c.	5.00c.
Brass, heavy	2.75c.	3.50c.
Brass, light	2.25c.	3.00c.
Hvy. machine composition	4.00c.	4.75c.
No. 1 yel. brass turnings	3.25c.	3.75c.
No. 1 red brass or compos. turnings	3.75c.	4.50c.
Lead, heavy	2.75c.	3.25c.
Zinc	1.50c.	2.00c.
Sheet aluminum	9.50c.	11.50c.
Cast aluminum	3.50c.	5.50c.

FABRICATED STRUCTURAL STEEL

Awards of 11,500 Tons Include Two Schools in Chicago—New Projects of 10,000 Tons Smallest of Year

NEW fabricated steel projects, at 10,000 tons, are the smallest of any week this year, and awards of 11,500 tons are the lowest since the first week in February, when the total was only 10,000 tons. The only sizable new projects are 1500 tons for two viaducts at Thirtieth Street and Schuylkill Drive, Philadelphia, and 2000 tons for a highway bridge at St. Charles, Mo. Awards include 2000 tons each for two schools in Chicago, and 2500 tons for a railroad bridge at Fort Wayne, Ind. Awards follow:

North Atlantic States

MILLBURY, MASS., 850 tons, State bridges, to McClintic-Marshall Corpn.

HARTFORD, CONN., 1400 tons, Post Office, to Bethlehem Fabricators, Inc.; previously reported to Palmer Steel Co.

HANCOCK, N. Y., 110 tons, school, to McClintic-Marshall Corpn.

GLEN COVE, N. Y., 120 tons, grade school, to Lieder Structural Steel Co.

BRENTWOOD, N. Y., 160 tons, trestle at Pilgrim State Hospital, to American Bridge Co.

STATE OF NEW YORK, 180 tons, reconstruction of bridge in Monroe County, to Lackawanna Steel Construction Co.

STATE OF NEW YORK, 250 tons, reconstruction of bridge at Rensselaer, N. Y., to American Bridge Co.

PATERSON, N. J., 700 tons, bridge over Passaic River at Spruce Street, to J. K. Cooke & Son, Inc., Clifton, N. J., for fabrication, and will be erected by builder.

The South

STATE OF TEXAS, 340 tons, highway bridge, to McClintic-Marshall Corpn.

Central States

ALPENA, MICH., 140 tons, bridge, to American Bridge Co.

MUSKEGON HEIGHTS, MICH., 625 tons, bridge, to Fort Pitt Bridge Works Co.

FORT WAYNE, IND., 2500 tons, New York Central Railroad, to Mount Vernon Bridge Co.

FORT WAYNE, 250 tons, orphans' home, to Rochester Bridge Co.

CHICAGO, 2000 tons, Galileo School, to Cargo Structural Steel Co.

CHICAGO, 2000 tons, Rembrandt School, to Vanderkloot Steel Works.

CHICAGO & NORTH WESTERN, 200 tons, bridge, to Lakeside Bridge & Iron Co.

ST. LOUIS, 109 tons, bridge for St. Louis-San Francisco Railway, to Mississippi Valley Structural Steel Co.

KANSAS CITY, MO., 260 tons, pumping stations for Standard Oil Co. of Indiana, to Kansas City Structural Steel Co.

Western States

LAS VEGAS, NEV., 100 tons, Post Office, to Consolidated Steel Co.

RED BLUFF, CAL., 225 tons, county bridge, to Minneapolis-Moline Power Implement Co.

SAN JOSE, CAL., 260 tons, Southern Pacific grade crossing, to Moore Dry Dock Co.

SAN JOSE, 200 tons, court house, to McClintic-Marshall Corpn.

HIGHLAND, CAL., 100 tons, orange packing plant, to Nigg Engineering Co., Los Angeles.

ADAMS COUNTY, WASH., 250 tons, span for Spokane, Portland & Seattle Railway, to Poole & McGonigle Co.

HOQUIAM, WASH., 100 tons, Post Office, to Isaacson Iron Works.

STRUCTURAL PROJECTS PENDING

Inquiries for fabricated steel work include the following:

North Atlantic States

NEW YORK, 600 tons, maternity hospital in the Bronx.

NEW YORK, 800 tons, colored Y.M.C.A. building at West 135th Street.

NEW YORK, 200 tons, Children's Aid Society building.

BROOKLYN, 100 tons, East New York Savings Bank building on Pitcairn Avenue.

BOROUGH OF QUEENS, 150 tons, addition to Queens General Hospital.

BROOKLYN, 400 tons, pier shed at Cranberry Street for Board of Transportation; all bids rejected and new bids being taken.

BEDFORD HILLS, N. Y., 300 tons, building at State Reformatory for Women.

STATE OF NEW YORK, 300 tons, institution building at West Haverstraw, N. Y.

PLATTSBURG, N. Y., 300 tons, grade crossing elimination for Delaware & Hudson Railroad; former bids rejected and new bids being taken.

ITHACA, N. Y., 500 tons, agricultural building for Cornell University; Smith & Caffrey, Syracuse, low bidder on general contract.

PHILADELPHIA, 1500 tons, viaducts for city at Thirtieth Street and Schuylkill Drive.

PHILADELPHIA, unstated tonnage, fire engine and truck station at 1127 Louden Street for Department of Public Safety.

GLENBURNIE, MD., 150 tons, high school.

WILMINGTON, DEL., 200 tons, Thomas F. Bayard School.

TRENTON, N. J., 100 tons, store for J. B. Van Sciver Co. on South Broad Street.

ALTOONA, PA., 350 tons, Post Office; bids rejected and new bids to be opened Oct. 26.

The South

BATON ROUGE, LA., 369 tons, bridges for Louisiana State Highway Commission; St. Bernard Parish, 148 tons, and Rapides Parish, 221 tons.

Central States

PAINESVILLE, OHIO, 115 tons, bridge at Mentor for Lake County Commissioners.

AURORA, ILL., 300 tons, Post Office; bids to be opened NOV. 3.

EAST ST. LOUIS, ILL., 105 tons, bridge for East Side Sanitary Commission.

CHICAGO, BURLINGTON & QUINCY RAILROAD, 300 tons, bridge.

STATE OF IOWA, 200 tons, highway bridge.

MILWAUKEE, 450 tons, for Electric Railway & Light Co.

STATE OF WISCONSIN, 300 tons, highway bridges.

ALMA, WIS., 620 tons, Lock No. 4 on Mississippi River. This job will also require 110,000 sq. ft. of steel piling.

STATE OF MINNESOTA, 100 tons, highway bridges.

ST. CHARLES, MO., 2000 tons, highway bridge.

Western States

COLUSA, CAL., 160 tons, sheet steel piling for weir.

SAN BENITO COUNTY, CAL., 200 tons, highway bridge.

MASON COUNTY, WASH., 300 tons, Skakomish River highway bridge.

FABRICATED PLATES

Pending Projects

COAST GUARD SERVICE, 400 tons, cutter for use on Lake Michigan.

LONG BEACH, CAL., 125 tons, tank and tower for Procter & Gamble Co.

LONG BEACH, 425 tons, reservoir.

SEATTLE, 400 tons, standpipe for West Seattle reservoir.

SAN FRANCISCO, 750 tons, Red Mountain bar siphon.

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Reduced Rates Ordered on Scrap in Southeast

WASHINGTON, Oct. 13.—Effective Jan. 4, the Interstate Commerce Commission has handed down a decision ordering reduced rates on scrap iron from points in North Carolina to Ashland, Ky., Portsmouth, Ohio, Harrisburg and Steelton, Pa., and East Radford and Lynchburg, Va. Reductions range from 40c. to $4.01 a net ton. The points of origin are Reidsville, Greensboro, Gibsonville, Burlington, Graham, Haw River, Hillsboro, Durham, Winston-Salem, Mount Airy, Fayetteville and Rockingham. The minimum carload will be 50,000 lb.

From these points to Ashland, Portsmouth, East Radford and Lynchburg, the commission prescribed rates which shall not exceed those made on the basis of 15 per cent of the first class rates prescribed from and to these points in the Southern class rate investigation case. From all these points of origin, except Mount Airy, Fayetteville and Rockingham, to Harrisburg and Steelton, the commission ordered the establishing of a rate of $4.45 a net ton. The present rate is $5.79. From Mount Airy and Fayetteville to Harrisburg and Steelton a rate of $4.65 was prescribed and from Rockingham the new rate will be $4.80. The present rate from all three points of origin also is $5.79.

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The Federal Trade Commission has dismissed a complaint against Continental Steel Corpn., Kokomo, Ind., involving the section of the Clayton Act prohibiting acquisition of capital stock in a competing company. Superior Steel Co., Canton, Ohio, and Chapman Price Steel Co., Indianapolis, are the companies whose capital stock was acquired.

Production Cannot Forge Ahead Without Stable Money

(*Continued from page 987*)

pay as many dollars in interest or principal as if the price level had not fallen. Taxes, instead of becoming lower, are increasing in amount.

Clearly, then, a change in the price level upsets the whole economic system of the nation. During the last two years, business concerns large and small have seen the value of their products shrinking month by month. At the same time, fixed charges have shown no falling off, and wage and salary costs per unit of output have not been reduced. Naturally, profits have dwindled and, in very many cases, turned into deficits. Is it surprising that, under such circumstances, it has been more than difficult to restore that feeling of optimism so necessary to pull us out of the depression? The experience of the past indicates that business rarely flourishes in times when the trend of the price level is downward. The present case is, then, no exception to the rule.

Can Price Level Be Controlled?

If changes in the purchasing power of money affect the national welfare so profoundly, the question arises as to whether anything can be done to prevent such changes. We regulate the value of railroad services—why not the price level?

The attitude of central bankers and of the treasury officials of most great nations toward the question of regulating the price level seems to be much the same as that of our forefathers toward diseases like typhoid or tuberculosis—"The Lord giveth and the Lord taketh away—blessed be the name of the Lord." Today we have learned that, in the field of health, "God helps him who helps himself." May the same not be true in the field of money and prices? Health experts eventually discovered that, by eradicating flies, inspecting the milk supply and chlorinating the drinking water, typhoid could be practically eliminated. Perhaps a scientific attack on the problem of control of the price level might yield results equally efficacious.

Although gold is the basis of our currency, we obviously do not use it to any extent in domestic trade—its place being taken by paper money and bank deposits subject to check. Now it has often been observed that the value of a commodity is affected by the value of substitutes for it. It is, for example, hard to keep up the price of oats when corn is cheap, hard to maintain coal prices when fuel oil prices are falling. Similarly, when paper money is issued freely, it tends to depress the value of the gold for which it is a substitute; in other words, it tends to raise prices. This oft-observed fact gives us a hint as to how the problem of regulating the price level may be attacked at present.

Today the Federal Reserve Banks hold in their vaults the lion's share of all the monetary gold stock of the world. This gold reserve is capable of supporting a superstructure of paper money and bank deposits far larger than that now existing. The experience of the past indicates strongly that an increase in the supply of money and checking accounts in the hands of the public would cause prices to rise. Is there a practical way of bringing about such an increase?

What Federal Reserve Can Do

The Federal Reserve Banks have the right to deal in securities in the open market. During 1930-1931, they have exercised that right to some extent, increasing their holdings of securities by some $200,000,000. The general price level has, nevertheless, continued to decline rapidly. It may be argued that this fact demonstrates the uselessness of trying to remedy matters by putting more money into circulation. This evidence is, however, far from conclusive, for $200,000,000 is little more than a drop in the bucket. Since the beginning of 1930, wholesale prices have, on the average, fallen by about 25 per cent. Were we to use their decline as a gage to measure the amount of money needed to put prices back to the 1929 closing level, we should therefore assume as necessary an increase in circulating medium of at least 25 per cent. The money work of the United States is done by some 21 billions of demand bank deposits and some five billions of currency. A 25 per cent increase would require over five billions of new money or money substitutes.

For several reasons, however, it is not feasible to calculate with any approach to precision the amount of new money needed. First, retail prices have not declined as much as wholesale prices. Second, a considerable part of the price decline is doubtless due to psychological reasons, but indirectly related to the money supply. Third, it is contended by some authorities that the effect of new money put into the hands of the public would automatically be multiplied by an expansion of the demand deposits of commercial banks, and these demand deposits are equivalent to money. Under the circumstances, one cannot say whether an injection of five billions of new money would be far too much or decidedly too little. The only conclusion which seems obvious is that the $200,000,000 already used by the Federal Reserve Banks for experimental purposes is but a driblet as compared to the probable amount required to restore general prices to the 1929 level.

More Money Means Higher Prices

It is not essential to know just how much money would be required to bring prices back to their level of two years ago. Experience everywhere has demonstrated amply that more money will raise prices. What we need at present is, then, enough new money to restore prices to their old level, regardless of the amount required. The amount can best be ascertained, not by reasoning, but by experimentation. Were the Federal Reserve Banks to buy vigorously for a few weeks, it would probably then be possible to estimate the total amount of new money required to bring about the desired adjustment in the price level.

The assertion has been made that, at present, it is not really feasible to put more money into circulation. Interest rates are already extremely low, but few wish to borrow, and those who do cannot furnish security acceptable to the bankers. To use the old illustration: "You can lead a horse to water, but you cannot make him drink."

It is true that the Federal Reserve Banks have done all in their power to encourage borrowing, but without results. Any feasible method of putting new money into circulation under present conditions must, then, depend upon some other device. Fortunately, such a device exists. The Federal Reserve Banks have the right to buy securities from the present owners. By so doing, they would put new money into the hands of those persons or corporations, and no question of borrowing would be involved.

Suppose that, tomorrow, the Federal Reserve Banks started to buy five billion dollars worth of bonds. Clearly, bonds would rise in price.

selling the bonds to the Federal Reserve Banks would find themselves in possession of cash. It would earn nothing if not invested. Some would use the cash to buy other bonds. Some would buy stocks. Some would buy grain. Some would buy iron. Some would buy land. In whatever commodity they invested their money, their added demand would cause the price of that article to rise. Soon the price rise would spread all along the line. Does it not seem highly probable that, with rising prices and the resultant increase in prospective profits, the cloud of pessimism now overhanging industry would quickly disappear, forward buying would commence, new orders would flow in, and prosperity would soon be restored to industry?

Limitations of Federal Reserve Powers

It appears probable, then, that the Federal Reserve Banks have it in their power to aid very materially in the process of bringing about business recovery. In one respect, however, their ability to control the price level is seriously limited. They can only increase the supply of circulating medium when they happen to have surplus gold reserves. Were they now to take the steps necessary to send prices upward, the value of gold here would be lessened, and it would probably begin to flow abroad, thus depleting their reserves and lessening their ability to regulate the value of gold.

The British appear to have taken the bull by the horns. While the general public can only guess at the policy which is to be adopted by England, the prediction is freely made that a moderate degree of inflation is soon to be expected. If it comes, it will raise prices, thus increasing the revenues of the British Government, and helping it to balance its budget. A rise in prices of their products would also enable British employers to pay the rates of wages fixed by the British unions and still make a profit. This would lessen unemployment and further lift the financial burden from the taxpayers.

Everything will be fine if the process is not carried too far. Too much inflation is just as disastrous as too much deflation. That is why the necessary process of increasing our currency supply may well be left to the Federal Reserve System. One could hope that the conservatism of the men in charge would lead them to check inflation as soon as the price level was restored to its 1929 altitude.

It might well be that stabilization accomplished through open market operations would prove expensive to the Federal Reserve Banks, for they might not be able to sell the bonds bought at a figure high enough to cover the purchase price. Clearly it should be the duty of the Federal Treasury to reimburse the banks for any losses incurred in the stabilization process. The public could well afford to repay any expenses incidental to stabilization, for the losses caused by a depression such as we are now experiencing are probably as great in a month as would be the cost of stabilization for a decade.

Even if, as most of us hope and expect, business soon begins to climb upward out of the trough of depression, we may still expect serious trouble if price averages remain in the vicinity of their present levels. Mortgagors will be unable to pay their indebtedness and hundreds of thousands of homes and farms will be lost by their present owners. The impairment of the security behind loans will throw into insolvency thousands of banks and financial institutions. The reduction of money wages to lower levels corresponding to the reduced prices of industrial products will bring strikes, riots, arson, and murder.

Yet, all of these disasters could easily be averted were we willing to apply modern scientific methods to our monetary system with but a fraction of the intensity with which they are used by the Government every day in building airplanes, battleships or radio apparatus. If business men ever come to realize that scientific control of national money and credit is just as important to their welfare as is scientific control in their production departments, they will doubtless insist on the elimination of the present antiquated method of allowing our price system to be governed by nothing more dependable than pure chance.

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Railroad Equipment

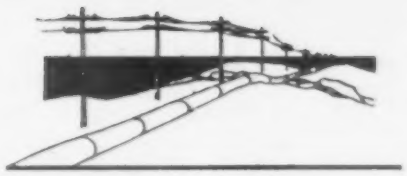
Continental Oil Co. has ordered 30 tank cars, 6000-gal. capacity, from Pressed Steel Car Co.

Fonda, Johnstown & Gloversville has ordered five interurban cars from J. G. Brill Co.

Atchison, Topeka & Santa Fe has ordered one articulated type, gas-electric rail motor car from the Pullman Car & Mfg. Corpn. The car will contain a 900-hp. Electro-Motive Co. power plant.

Missouri-Kansas-Texas has ordered two gas-electric rail motor cars from the St. Louis Car Co.

Pacific Fruit Express is understood to have started building 500 refrigerator cars in its own shops.



PIPE LINES

Standard Oil Co. of New York, 26 Broadway, New York, has authorized immediate construction of 6-in. gasoline pipe line from East Providence, R. I., to Springfield and Douglas, Mass., 98 miles long.

Sun Oil Co., 1608 Walnut Street, Philadelphia, contemplates installation of gasoline and oil pipe line from point near Syracuse, N. Y., to Lake Ontario, about 40 miles. Project will be carried out by Sun Pipe Line, Inc., a subsidiary.

Texas Natural Gas Utilities, Inc., Petroleum Building, Houston, Tex., plans extensions in pipe lines in vicinity of Port Lavaca, totaling from 35,000 to 40,000 ft. of 2- and 4-in. welded pipe, to cost over $50,000.

City Council, Brunswick, Md., is considering installation of a pipe line, about seven miles long, from Yourtee Spring, Brownsville, to point near city for water supply.

Board of City Trustees, Brea, Cal., is planning fund of $20,000 for installation of about 14,000 ft. of 4-in. pipe, to replace a present 3-in. line for municipal water service.

Texas-Empire Pipe Line Co., Bartlesville, Okla., has been organized under State laws, with capital of $5,000,000, and will be affiliated with company of same name recently chartered under Delaware laws. Company will operate an oil pipe line from East Texas oilfields to Port Arthur, Tex. H. R. Straight, Bartlesville, is president.

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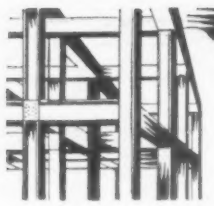
Hanna to Sell Pig Iron Through Own Offices

The Hanna Furnace Corpn., Buffalo, subsidiary of the National Steel Corpn., Pittsburgh, has established its own sales departments in New York, Philadelphia and Boston to take over the sale of its foundry, malleable and silvery pig iron and ferrosilicon. The company was formerly represented in the Eastern territory by Rogers Brown & Crocker Brothers, Inc.

The New York office, at 30 Church Street, will be in charge of C. R. Welles as resident agent. For the past several years he has been associated with the New York office of Pilling & Co. C. E. Trommer, who has been identified with the Rogers Brown organization at New York, will be resident agent at Philadelphia, with headquarters at 902 Packard Building. The Boston office, at 514 Chamber of Commerce Building, will be in charge of S. B. Burke, who formerly represented the Hanna company in New England and is now being transferred from the Buffalo office. These changes are effective Oct. 15.



PLANT EXPANSION AND EQUIPMENT BUYING

Subway List Placed in New York

About 50 Tools for Metal-Working and Wood-Working Ordered—Lycoming May Buy Again

THE New York district is the center of most of the outstanding activity in machine tool trade. The New York Board of Transportation has placed orders for about 50 metal-working and wood-working machines for subway repair shops, and the purchase of about $150,000 worth of tools is expected soon from the Lycoming Mfg. Co., Williamsport, Pa., which recently bought about $400,000 worth of equipment.

In other sections of the country there has been no noticeable change in the volume of business, though inquiries are appearing somewhat more frequently in certain sections. These inquiries are not usually indicative of early purchases, but are in line with plans that many companies have in mind to carry out when business conditions warrant. Manufacturers of metal goods have had a long period of depressed business in which to consider their future course; many of the contemplated production activities will require the purchase of modern machinery, but most of this prospective business will be postponed until business recovery is well on its way. Therefore, the machine tool industry is not expecting much change this year.

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NEW YORK

The Board of Transportation, New York, which recently took bids on about 50 metal-working and wood-working machines for subway repair shops, has distributed the orders. The bulk of the business went to Montgomery & Co., New York, which will furnish grinders, sensitive drilling machines, a radial drill, a turret lathe and a carwheel lathe. The Pratt & Whitney Co. will furnish four Boye & Emmes lathes of 14-in., 16-in., 27-in. and 30-in. dimensions, and the Niles Tool Works will supply a wheel press and a carwheel boring machine. The Brooklyn Navy Yard is expected to readvertise for four engine lathes of 24-in. and 30-in. sizes not bought against its recent list. The Lycoming Mfg. Co., Williamsport, Pa., which recently bought about $400,000 worth of tools for the manufacture of engine blocks and frames for automobile engines, is expected to place additional orders of about $150,000 for machining of motor parts. Other than these items, the local machine tool market is very quiet. Prospective buyers are still inclined to postpone purchases they have had under consideration.

PITTSBURGH

Inquiry for machine tools has shown some improvement since the first of the month, but little of it is of the type which will result in early orders. Many companies are getting estimates of certain changes in their production and if the suggestions are acted upon the changes are not likely to take place before the beginning of 1932. New orders are slow. The National Transit & Pump Co., Oil City, Pa., has purchased a horizontal boring mill.

Orders for heavy machinery and equipment for steel plants have not been numerous in the last few weeks and work on some projects placed heretofore has been held up. Prospective business is heavy, but a number of contemplated improvements will undoubtedly have to await business recovery.

NEW ENGLAND

Some New England manufacturers of machine tools report a slight improvement in inquiries from automobile manufacturers, but say foreign interest has evaporated as a result of developments in the European financial situation. Business with local dealers continues dull, with little prospect of improvement this month, at least.

Small tool sales are picking up and give indication of passing those in September.

CLEVELAND

Orders and inquiries for machine tools were light the past week and there are no indications of an early improvement. Business so far this month shows no gain over the corresponding period of September. An improvement in demand for screw machine products is reported, but metal-working plants in other lines have not increased operations. The market in the Detroit territory continues slow, although a few new inquiries have come out for single machines from die making shops.

MILWAUKEE

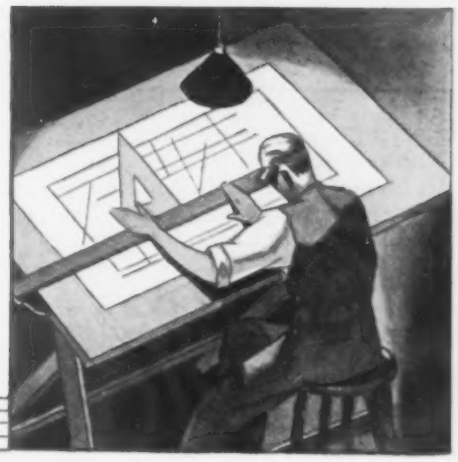
With general industrial activity still limited machine tool business continues negligible. The past week brought some improvement in inquiries, but orders were scarce and apparently were confined to the most urgent replacement requirements. Automotive industries, which had been counted upon to create at least some aspect of revival by this time, are doing little, and the agricultural machinery industry is not living up to earlier promises. The situation, however, is by no means regarded as hopeless, for there are signs that a considerable volume of business is ready for release just as soon as conditions warrant.

CINCINNATI

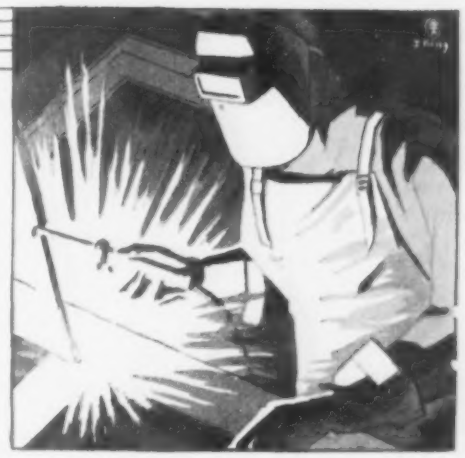
Bookings of machine tool manufacturers were slightly better the past week. Interest in retooling is following closely the trend of business, users indicating that they cannot make purchases until their own order books require it. Orders for repair parts are fair.

CHICAGO

Recent developments in the local machine tool market afford little by which to gage a trend. Sales, except of a few presses, are light and inquiries, on the whole, are unsatisfactory. It is of interest that a number of the presses recently ordered are



INCLUDE *this* ECONOMY IN YOUR PLAN!



THE ECONOMY AND SUPERIORITY of riveted or welded structural steel is being recognized in a rapidly widening variety of uses and fields, particularly in the manufacture of machinery bases and frames. Many manufacturers, facing highly competitive sales conditions, are incorporating structural steel in their designs to reduce costs and to improve their product.

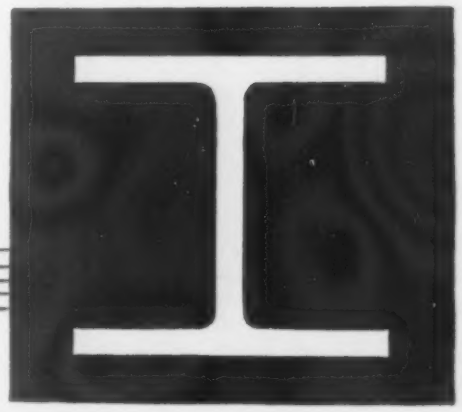
The use of structural steel eliminates the capital investment, overhead and operating expenses of a pattern shop, patterns in storage and foundry. Instead, there is only a small stock pile of selected rolled steel shapes, available for instant use and capable of being fabricated into an endless variety of machine parts. The time between design and delivery is materially shortened.

C B Sections have added a new impetus to this modern method of machine construction because of their unique advantages. Carnegie Engineers are at your service at all times and will gladly consult with you regarding the use of structural steel in machine construction.

CARNEGIE STEEL COMPANY · PITTSBURGH

Subsidiary of United States Steel Corporation

134



for manufacturers who are preparing to make products that will sell at low prices. Manufacturers of automobile parts and accessories show interest in machine tools but orders are lacking. Studebaker and Bendix companies, both at South Bend, Ind., appear as prospective purchasers of machine tool equipment.

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New York

PLANS are being considered by Long Island Railroad Co., Pennsylvania Terminal, New York, for electrification of Stewart division from Brooklyn and vicinity to Babylon, L. I., by third rail system.

Signal Supply Officer, Signal Corps, Army Base, Brooklyn, is asking bids until Oct. 30 for reel carts in lots of 100 to 500.

Kings County Lighting Co., 6740 Fourth Avenue, Brooklyn, has plans for two-story addition to power house and improvements in present unit, to cost over $75,000 with equipment.

International Television-Radio Corpn., New York, has been organized by William H. Priess, head of William H. Priess Corpn., 96 Prince Street, radio equipment, and plans operation of plant for production of complete television sets with sound apparatus, including parts and assembling. Maxwell Fisher will be secretary-treasurer.

A. M. De Nigris, Inc., 1318 Oak Point Avenue, Bronx, New York, operating a stone and granite works, has filed plans for a one-story stone-cutting and polishing shop, 25 x 89 ft.

Brooklyn Union Gas Co., 176 Remsen Street, Brooklyn, is planning a two-story addition to equipment storage and distributing plant and garage building.

George Peller, 3044 Ocean Parkway, Brooklyn, and associates have organized Product Machine & Tool Works, Inc., and plan operation of factory for manufacture of tools and equipment.

Highway Trailer Co., Edgerton, Wis., manufacturer of motor truck trailers, parts, etc., has leased building at Long Island City, on site 100 x 100 ft., for factory branch, service and distributing plant.

McNulty Brothers Coal Co., 1932 Arthur Avenue, Bronx, New York, has filed plans for new coal pockets with distributing and loading facilities, to cost over $40,000 with equipment. S. J. Kessler, 125 West Forty-fifth Street, is architect and engineer.

Board of Education, Sussex, N. J., contemplates installation of manual training equipment in new two-story high school, to cost over $175,000, for which bids have been asked on general contract. Jacoby & Everett, Commonwealth Building, Allentown, Pa., are architects.

Department of Public Affairs, City Hall, Newark, has awarded general contract to Daniel J. Cronin, 713 South Orange Avenue, for new municipal automobile service, repair and garage building, two stories, 130 x 190 ft., to cost about $300,000 with equipment. Joseph W. Costello is chief engineer of department.

Eastern Seaboard Mfg. Co., Inc., Bayonne, N. J., care of Tucker & Tucker, Broadway and Twenty-fifth Street, attorneys, recently organized, plans operation of factory for manufacture of electric refrigerating equipment and parts.

P. C. Van Nuys, 1 West Main Street, Somerville, N. J., architect, has plans for a two-story automobile service, repair and garage building, 100 x 200 ft., to cost over $100,000 with equipment.

Board of Education, Union Street, Lodi, N. J., plans installation of manual training equipment in two-story and basement high school, to cost close to $350,000, for which bids will be asked in 60 to 90 days. Frank Pirrone, 104 Midland Avenue, Garfield, N. J., is architect.

New York & Richmond Gas Co., 691 Bay Street, St. George, S. I., is considering erection of a new artificial gas plant at Honeywood, S. I., to cost about $125,000 with equipment.

Board of Education, Hawthorne, N. J., contemplates installation of manual training equipment in new two-story high school, to cost over $200,000, for which a special election has been called on Oct. 20 to approve project. Fanning & Shaw, 49 Ward Street, Paterson, N. J., are architects.

Lovell-Dressel Co., Arlington, N. J., manufacturer of electric lighting equipment, etc., will place its foundry and machine shop on a full-time production schedule following curtailment for several weeks. Company has secured Government contract for marine lighting equipment for new airplane carrier, Ranger, and for a new cruiser; another Government order has been received for airfield lighting equipment.

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New England

APPLICATION has been made by New England Terminal Co., Quincy, Mass., recently organized by Matthew P. Sheahan, 46 Bates Avenue, and associates, to erect a new bulk oil storage and distributing plant on 74-acre tract on Neponset River. Project will consist of two main units, with tanks and facilities for handling a total of 860,000 bbl. at one time, with administration building, automobile service and garage building and other structures, to cost close to $1,500,000 with equipment.

Berst-Foster-Dixfield Co., Dixfield, Me., manufacturer of wood products, is erecting a three-story addition, 100 x 200 ft., for which general contract was recently let to James H. Kerr, Rumford, Me., to cost over $60,000 with machinery. Homan W. Hallock, Oswego, N. Y., is architect. F. W. Smith is manager.

Joseph Paul, 26 Wood Street, Providence, R. I., and associates have organized Richie & Paul, Inc., to operate an electroplating works. Anthony Matera, Providence, is interested in new company.

Boston Elevated Railway, 31 St. James Avenue, Boston, has asked bids on general contract for one-story addition to bus service and garage building at Medford, Mass., 65 x 155 ft., to include motor bus repair facilities, oil storage and distributing unit, etc., to cost over $75,000. A. J. Blackburn is company architect, address noted.

Farrell, Birmingham Co., Ansonia, Conn., has secured a contract from D-N Incinerator Co., Winston-Salem, N. C., for all forgings and other machinery for its incinerator plants, and will increase capacity for manufacture of such equipment. It is understood that assembling will be carried out by D-N Incinerator Co.

Board of Education, Providence, R. I., contemplates installation of manual training equipment in new two-story school on Windmill Street, 208 x 207 ft., to cost $875,000, for which bids on general contract will be asked before close of month.

Massachusetts Auto Service Co., 1228 Massachusetts Avenue, Dorchester, Boston, will soon begin erection of one-story repair shop and service addition, 60 x 150 ft., to cost close to $50,000 with equipment. R. E. Bossi, 117 East Cottage Street, is architect.

Wright & Carson Co., Milford, Conn., has changed its name to Milford Rivet & Machine Co.

Two turbines and other equipment will be required for a $150,000 heating plant to be built by State of Massachusetts at Gardner Mass., bids for which will soon be asked.

Fire recently destroyed pattern shop and patterns of Valley Foundry Co., East Hampton, Conn., unit of Connecticut Foundry Co., Rocky Hill, Conn. Plant will be rebuilt and other improvements made.

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Chicago

BOARD OF EDUCATION, City Hall, Minneapolis, contemplates installation of manual training equipment in new three-story and basement Sheridan school, to cost about $500,000, for which bids are expected to be called on general contract early in November. Bureau of Buildings, Architectural Division, 811 N. E. Broadway, is architect. George F. Womrath is business superintendent.

D. M. Sechler Carriage & Implement Works, Moline, Ill., is considering rebuilding plant recently destroyed by fire, with loss over $50,000 including equipment.

White Eagle Oil Co., Fargo, N. D., has plans for a bulk oil storage and distributing plant, with main unit, 150 x 360 ft. Facilities will be provided for initial capacity of 60,000 gal., to cost about $45,000. E. A. Rudquist is division manager at Fargo.

Chicago Great Western Railroad Co., 179 West Jackson Boulevard, Chicago, has awarded general contract to Hansen & Hansen, 508 Franklin Street, Council Bluffs, Iowa, for addition to engine house at Council Bluffs, 60 x 100 ft., with shop facilities, to cost about $21,000 with equipment.

State Board of Administration, Bismarck, N. D., is asking bids until Oct. 20 for power house equipment, at State school for feeble-minded, Grafton, N. D., including boilers, firing equipment, forced draft fan units, feed-water pumps, generating unit, feed-water heater and accessories. Pillsbury Engineering Co., 1200 Second Avenue South, Minneapolis, is consulting engineer. Ernest G. Wanner is executive secretary.

Northern Pacific Railway Co., St. Paul, Minn., is planning to rebuild shop unit at local car repair and construction shops, recently destroyed by fire, with loss of $30,000 including equipment.

Iowa Packing Co., Des Moines, Iowa, meat packer, is considering enlargement of plant with erection of two or more buildings, to cost over $60,000 with equipment.

Jefferson Electric Co., Chicago, will build a new plant at Bellwood, Ill., to replace two plants it now occupies. Contract has been placed with Austin Co.

Duluth Steam Corpn., Duluth, Minn., is contemplating immediate construction of a $1,500,000 central heating system.

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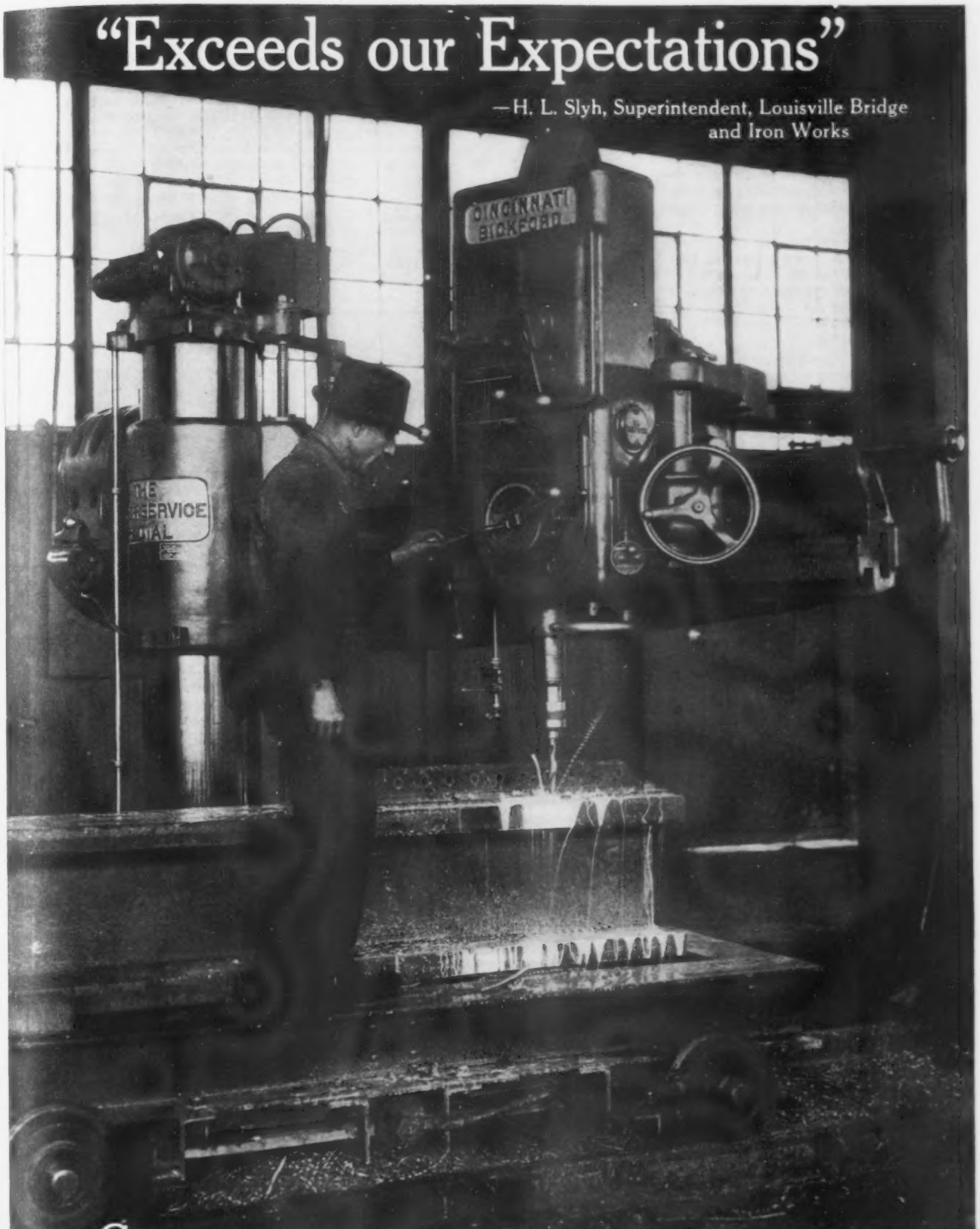

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Cincinnati

PLANS are under way by Kroger Grocery & Baking Co., 35 East Seventh Street, Cincinnati, for new baking plant at St. Louis, with installation of electric-controlled traveling ovens, 85 ft. long, mixing machinery, conveying and other equipment, to cost over $700,000 with equipment. Company will also carry out expansion at Cincinnati plant, with installation of baking, coffee-roasting machinery and other equipment, to cost about $250,000.

Beavers-Remmers-Graham Co., Hopeland and Concord Streets, Dayton, Ohio, manufacturer of soaps, will carry out expansion and improvements, to cost about $85,000. Company will remove factory at Cincinnati to Dayton, where production will be concentrated.

Constructing Quartermaster, United States Army, Bowman Field, Ky., will receive bids until Nov. 3 for double hangar for air corps, with annexes for shop repair and reconditioning, and boiler house addition.

Sun Oil Co., 1608 Walnut Street, Philadelphia, and 1241 Chase Street, Cincinnati, has awarded general contract to Dawson-Evans Construction Co., 5300 Carthage Pike, Cincinnati, for bulk oil storage and distributing plant at Cincinnati, to cost close to $50,000 including equipment.

Board of Education, Ludlow Building, Dayton, Ohio, plans installation of manual training equipment in new two-story and basement high school, to cost $300,000, for which general contract has been let to Industrial Building Co., Dayton. Herman & Brown, Reibold Building, are architects.

City Council, Richmond, Ky., contemplates installation of electric-operated pumping machinery and auxiliary power equipment in connection with extensions and improvements in municipal waterworks, to cost close to $50,000. Black & Veatch, Mutual Building, Kansas City, Mo., are consulting engineers.

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Philadelphia

PERMISSION has been secured by Philadelphia Electric Co., Tenth and Chestnut Streets, Philadelphia, for controlling interest in Philadelphia Steam Co. Purchasing company plans immediate expansion, including development of new steam power plants for central station service and installation of steam lines for buildings in downtown district, to cost about $4,000,000 with equipment. Company has awarded general contract to United Engineers & Constructors, Inc., 112 North Broad Street, for new electric control plant to cost $220,000 with equipment. John T. Windrim, Commonwealth Building, is architect.

Carl Machine Co., Philadelphia, has leased floor in building at 228 Arch Street, for machine works.

C. E. Myers, director, Department of City Transit, City Hall Annex, Philadelphia, will receive bids until Oct. 27 for station control equipment.

Board of Education, Phillipsburg, N. J., is considering installation of manual training equipment in new multi-story high school to cost close to $200,000, for which general contract has just been let to H. E. Stoudt & Co., Bethlehem, Pa.

Board of Trustees, Hershey Industrial School, Hershey, Pa., has plans by P. D. Witmer, Hershey, architect, for new group of industrial and vocational training shops, to cost over $1,000,000 with equipment.

Paul O. and Guy C. Brosius, Lock Haven, Pa., and associates have organized West Branch Corpn., Williamsport, Pa., and plan operation of factory for manufacture of parts and equipment for automobiles and aircraft. Warren J. Bauman, Lock Haven, will be an officer of company.

Bond Mfg. Corpn., Fourteenth and Locust Streets, Wilmington, Del., manufacturer of bottle caps, collapsible tubing and kindred products, has plans for a two-story addition, 60 x 300 ft., to cost over $60,000 with equipment. Brown & Whiteside, Inc., duPont Building, is architect.

Bureau of Supplies and Accounts, Navy Department, Philadelphia and Washington, is asking bids until Oct. 27 for one motor-driven engine lathe and for 300 aircraft airspeed indicators.

Board of Education, Throop, Pa., is considering installation of manual training equipment in new two-story and basement high school to cost close to $200,000. L. M. Davis, Rehrig Building, Scranton, Pa., is architect.

Department of Public Works, Scranton, Pa., is asking bids until Oct. 22 for one asphalt mixing machine. Bureau of Engineering, F. J. Miller, director, is in charge.

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St. Louis

EXPANSION is being arranged by Butler Mfg. Co., 7400 East Thirteenth Street, Kansas City, Mo., manufacturer of sheet metal products, bins, etc., for production of new automatic coal stoker. Building at 2525 Pennway has been taken over, primarily for assembling, with manufacture of sheet metal parts, finishing of rough castings, etc., carried out at Thirteenth Street plant; castings will be produced by outside foundries in Kansas City. It is planned to consolidate new manufacturing unit at main Butler works later.

City Council, Fulton, Mo., plans installation of municipal natural gas distributing system, to cost $80,000. Fund has been authorized for work.

H. R. McKnight, Rogers, Ark., and associates have organized Titanium Corpn. of America, Inc., and plans development of properties in Hot Springs County, near Malvern, Ark., for production of titanium. Installation will include mining machinery, conveying, power and other equipment. Bailey V. and Waldo Emery, Tulsa, Okla., are interested in project.

Common Council, Grand Island, Neb., has authorized plans for an addition to municipal electric light and power house, including improvements in present unit, to cost about $25,000. Additional equipment will be installed.

Construction Quartermaster, United States Army, Fort Sill, Okla., is asking bids until Oct. 30 for new air corps hangar, with repair and reconditioning facilities, boiler house annex, etc., to cost about $55,000.

Board of Public Works, Lincoln, Neb., contemplates call for bids early in November for new electric-operated municipal pumping plant near Ashland. D. L. Erickson, City Hall, is engineer.

Morris-Collier Corpn., Dallas, Tex., manufacturer of sharpeners for safety razor blades and kindred specialties, has leased building at Monett, Mo., and will remodel for new plant. Certain machinery will be transferred from Dallas plant to new location.

J. L. Lunsford, Sixth and Millington Streets, Winfield, Kan., operating a meat-packing plant, has plans for a second story addition, 70 x 100 ft., including improvements in present plant, to cost close to $25,000 with equipment.

Missouri Pacific Railroad Co., St. Louis, has reopened its repair shops at Sedalia, Mo., following a shut-down since Sept. 10. Work will be on a five-day week schedule.

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Buffalo

PLANS are being completed by Hecker-H-O Co., Genesee Building, Buffalo, for an eight-story addition to flour, grain and cereal mill, to cost about $1,000,000 with elevating, conveying and other equipment.

Sprague-Sells Corpn., 523 Cornwall Avenue, Buffalo, manufacturer of canning and refrigerating machinery, parts, etc., is considering removal of plant to main works at Hoopeston, Ill., where it is planned to build an addition to cost about $150,000. Company is a division of Food Machinery Corpn., San Jose, Cal.

Leo Maak, 565 Welden Avenue, Buffalo, and associates have organized Export Boiler Works, and plan operation of works for manufacture of boilers, tanks and other plate products.

Sun Pipe Line, Inc., Syracuse, N. Y., an interest of Sun Oil Co., 1608 Walnut Street, Philadelphia, contemplates erection of new bulk oil storage and distributing plant on Lake Ontario, about 40 miles from Syracuse, for main water distributing plant for Great Lakes district, to cost over $75,000.

Morse Chain Co., Ithaca, N. Y., is increasing production of timing sprockets and chains, following receipt of large orders from about six motor car companies.

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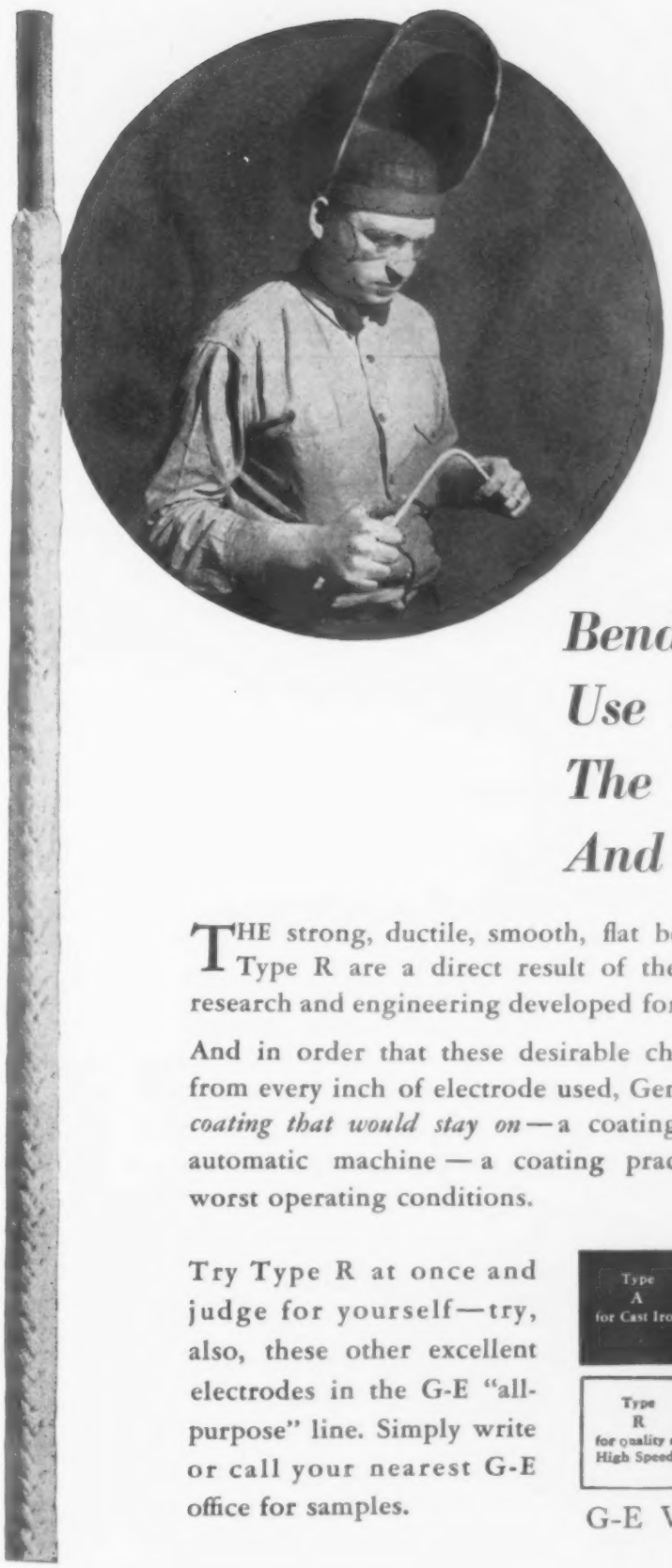
Pittsburgh

PLANS are under way by H. F. Watson Paper Co., 143 East Sixteenth Street, Erie, Pa., manufacturer of roofing and kindred paper stocks, for a one-story addition, 80 x 200 ft., for storage and distribution, to cost about $45,000 with equipment. Company is a subsidiary of Ruberoid Co., 95 Madison Avenue, New York, manufacturer of roofing products.

Gulf Refining Co., Frick Annex, Pittsburgh, has work under way on oil and gasoline storage and distributing plants at Donora and McKeesport, Pa., and Wheeling, W. Va., each with capacity of about 300,000 gal., to cost over $100,000 with pumping and other machinery. New units will be operated in conjunction with a main bulk storage and distributing plant on Neville Island, Pittsburgh.

Herman Lund, Erie, Pa., operating a dry dock and boat-building works, has purchased additional waterfront property as site for new boat-building and repair plant, to cost about $50,000 with equipment.

City Council, New Martinsville, W. Va., is considering a municipal electric light



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and power plant to cost close to $50,000 with equipment. R. S. Husselman, Hippodrome Building, Cleveland, is consulting engineer.

Appalachian Electric Power Co., Charleston, W. Va., has applied for permission to build a transmission line over Kanawha River, near Buffalo, W. Va.

Copper Range Co., Boston, has acquired substantial interest in C. G. Hussey & Co., Pittsburgh, operators of copper and brass rolling mills. Hussey organization, formerly a partnership, has been incorporated, but management will not be changed. E. H. Binns will continue as chairman; J. P. Lally, as president, and P. F. Beaudin and F. W. Paine, of Copper Range Co., have been named vice-president and treasurer, respectively.

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Detroit

STATE HOSPITAL DEPARTMENT, Lansing, Mich., is considering extensions and improvements in power plant at Newberry, including installation of automatic coal feeders and other equipment, to cost about $45,000. Dr. E. H. Campbell is superintendent at institution.

Gibraltar Floors, Inc., 48 West State Fair Avenue, Detroit, is planning an addition to storage and distributing plant, to cost about $30,000 with equipment.

Copeland Products, Inc., Mount Clemens, Mich., manufacturer of electric refrigerating units, parts, etc., has awarded general contract to Beyster & Olmstead, General Motors Building, Detroit, for one-story addition, 50 x 200 ft., for engineering service, to cost about $50,000 including equipment. Other expansion is contemplated later.

United Platers, Inc., 994 Madison Avenue, Detroit, recently organized with capital of $15,000 by H. E. Adelsperger, Jr., 940 Westchester Road, Grosse Pointe, Mich., and associates, plans operation of metal plating works. Same interests have organized Platers, Inc., 3456 Denton Avenue, Hamtramck, Mich., to operate similar plant there. J. C. Nankervis, Detroit, is interested in both companies.

Consumers Power Co., Jackson, Mich., has work under way on new high-tension power substation at Crotan Dam, in connection with extensions and improvements in transmission and distributing lines in that district, to cost over $150,000.

W. J. Breen Gravel Co., Grandville Road, Grand Rapids, Mich., has awarded general contract to Owen-Ames-Kimball Co., Grand Rapids, for new sand and gravel washing, storage and distributing plant, to include storage bins, loading docks, mechanical-washing equipment, conveying machinery, etc., to cost about $100,000.

Schwarze Electric Co., Adrian, Mich., has perfected new automobile windshield defroster, metal chromium plate, with copper reflector, heating coil, etc., and plans commercial production. Harry M. Berry is general manager.

Chevrolet Motor Co., Detroit, is arranging for resumption of operations at foundry at Saginaw, Mich., recently closed for equipment changes and improvements, and inventory. It is expected to give employment to about 300 men.

Officials of Detroit Aircraft Corpn., 115 Campau Street, Detroit, are arranging to segregate lighter-than-air and heavier-than-air plane divisions of company. First noted will be known as Metalclad Airship Corpn. and will concentrate production at Detroit; last noted will be known as Lockheed Aircraft Corpn., and will take over certain divisions of company and part of shop facilities at Detroit, as well as plant at Burbank, Cal.

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Milwaukee

BOARD of Vocational Education, Manitowoc, Wis., has accepted bid of Schuette Construction Co., local, for general contract to build new vocational school at $130,000. Total cost of structure will be $185,560 and about $25,000 will be expended for initial equipment. O. H. Senglaud is president of board.

Western Cable & Electric Co., Baldwin, Wis., contemplates erection of plant addition. Work probably will not be started until spring.

Mechanical Engineering Co., Milwaukee, has been incorporated with 250 shares of common stock, no par value, and is establishing machine shop at North Fratney Street and East Vienna Avenue to do general jobbing business in metal products. At present company is working on order for 15,000 carbureters designed by J. B. Drahonovsky, Milwaukee. Principals in new company are William Drahonovsky, F. J. Heaton and William Kopp.

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South Atlantic

PLANS are under way by Consolidated Gas, Electric Light & Power Co., Lexington Building, Baltimore, for a new artificial gas storage and distributing plant in Jones Falls Valley, where 55 acres has been selected. Project will include a steel gas holder 182 ft. in diameter, and 306 ft. high, and will cost over $500,000 with power facilities. Company has secured contract from Pennsylvania Railroad Co. for furnishing power for its electrified system between Havre de Grace, Md., and Washington, and will carry out expansion for power lines and substation facilities in that territory. Service will be furnished primarily from new hydroelectric generating plant of Safe Harbor Water Power Corpn., an affiliated interest, at Safe Harbor, Pa.

United States Engineer Office, Munitions Building, Washington, and Buffalo, N. Y., is asking bids until Oct. 21 (Circular 55) for two complete Diesel engines, direct reversible, and for one 15-kw. electric generating set and auxiliary equipment.

Greensboro Coca-Cola Bottling Co., Greensboro, H. M. Draper, 621 Elm Street, head, has plans by Pringle & Smith, Norris Building, Atlanta, Ga., architects, for new two-story bottling plant, to include installation of automatic bottling machinery, conveying and other equipment, to cost about $85,000.

Bureau of Yards and Docks, Navy Department, Washington, is asking bids until Oct. 21 for a structural steel beacon tower and obstacle at naval reserve aviation base at Opa Locka, Miami, Fla.

American Airways, Inc., Candler Field, Atlanta, Ga., with headquarters at 122 East Forty-second Street, New York, has plans for new hangar, with repair and reconditioning shop, to cost about $70,000 with equipment. E. A. Slater, Dallas, Tex., is company engineer.

Board of Trustees, Caswell Training School, Kinston, N. C., has asked bids on general contract for an addition to boys' industrial school unit at Hines Junction, to cost over $30,000 with equipment. Benton & Benton, Wilson, N. C., are architects. Dr. W. H. Dixon is superintendent.

General Purchasing Officer, Panama Canal, Washington, will receive bids until Oct. 22 for dredge dipper parts, pipe, wire rope, circular milling attachment, meter-testing blocks, pipe unions, railing fittings, valves, manhole frames and covers, and other equipment.

Constructing Quartermaster, Fort Benning, Ga., will receive bids until Oct. 29 for an underground electric distributing system.

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Cleveland

CONTRACT has been let by Firestone Tire & Rubber Co., Akron, Ohio, to Austin Co., for three-story factory branch, service and distributing plant at Chicago, to cost over $300,000 with equipment.

National Milling Co., 2221 Front Street, Toledo, Ohio, has asked bids on revised plans for rebuilding section of grain mill and elevator, destroyed by fire several weeks ago, to cost over $100,000 with equipment. Company is affiliated with National Biscuit Co., New York; architectural department of last noted company, Louis Wirsching, Jr., manager, is in charge.

City Council, Wellsville, Ohio, has plans for new pumping plant for municipal waterworks, with installation of electric-operated pumping machinery. R. D. McGill is city engineer.

United Trailer & Body Corpn., Akron, Ohio, care of A. D. Zook, 1011 Second National Bank Building, recently organized by J. Leslie Smith and Floyd E. Chaplin, plans operation of works for manufacture of automobile bodies, trucks trailers and kindred equipment.

Apex Electrical Mfg. Co., 1067 East 162nd Street, Cleveland, is operating its electric washing machine plant on a daily two-shift, 16-hour basis. Sales of washing machine units show an increase of 70 per cent for first nine months of year, as compared with corresponding period of 1930.

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Indiana

CONTRACT has been let by City Council, Huntingburg, to W. A. Armstrong, Somerville, for addition to municipal electric light and power plant, including improvements in present unit, to cost about $40,000. Additional equipment will be installed. Charles Brossman, Chamber of Commerce Building, Indianapolis, is consulting engineer.

Indiana Cutlery Co., Inc., Terre Haute, recently organized by John E. Farley, Terre Haute, and associates, plans operation of factory for manufacture of knives and other cutlery. Walter J. Slattery, Terre Haute, is interested in company.

City Council, Richmond, has authorized a fund of $400,000 for extensions and improvements in municipal electric light and power plant, including installation of a 15,000-kw. turbo-generator unit and auxiliary equipment.

State Prison Board, Indianapolis, will equip larger part of new three-story and basement building, 80 x 160 ft., to be erected at State Reformatory, Pendleton, as a trade and vocational school, other

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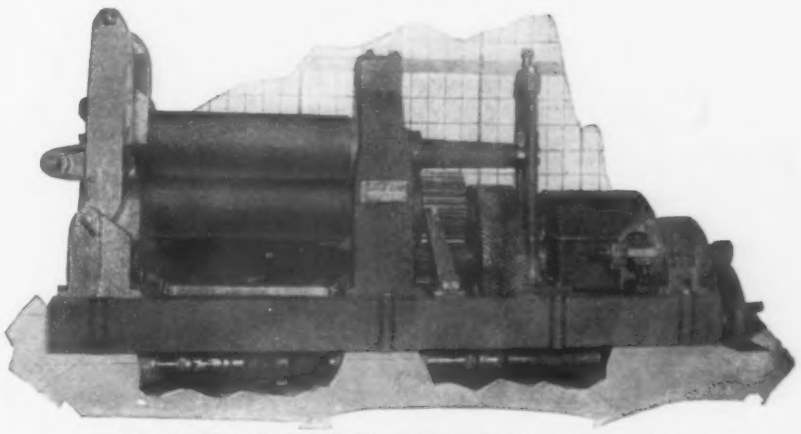
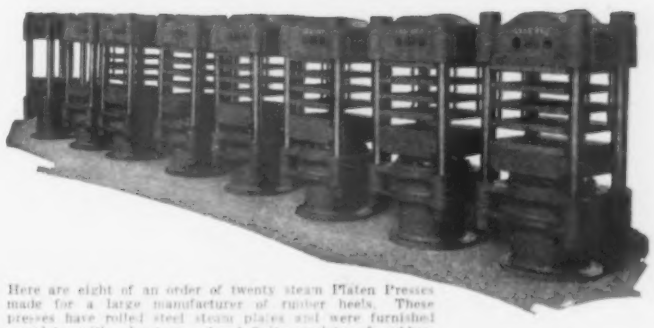


A Lake Erie Plate Bending Roll built for General Electric to roll 48 inch motor frames of 3 inch plate. Note the excellent method by which the housing end is dropped to permit the expeditious removing of completed cylinders.



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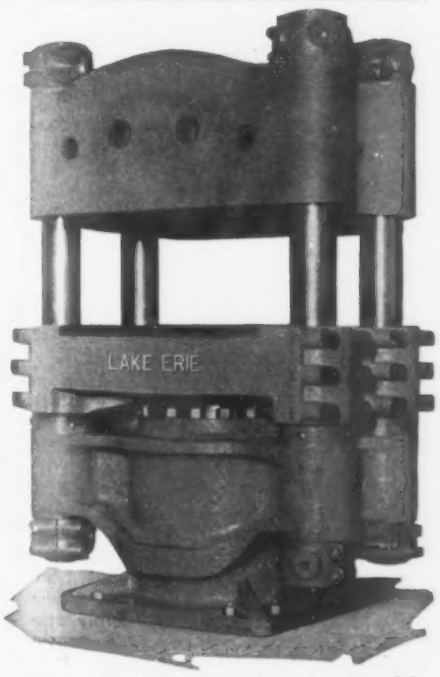

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BUFFALO NEW YORK

part to be used as a dormitory. New structure will cost about $90,000 including equipment. Ralph Howard is superintendent at institution.

Board of Education, Angola, contemplates installation of manual training equipment in new two-story and basement high school, to cost $150,000, for which it is expected to ask bids on general contract in 60 to 90 days. Pohlmeyer & Pohlmeyer, Central Building, Fort Wayne, are architects.

Perfect Circle Co., Hagerstown, manufacturer of automobile piston rings, is running on a capacity schedule with regular working force. Sales for first eight months were 21 per cent in excess of those for same period in 1930.

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Gulf States

PLANS are being considered by Hartman Interests, Inc., care of H. W. Hartman, vice-president, Gulf Building, Houston, Tex., for new oil refinery on Houston ship channel for production of high-test gasoline, lubricating oils and other oil products. Plant will have initial capacity of 25,000 bbl. a day, and will cost over $2,000,000 with machinery, including tanks and other storage and distributing facilities. Company will develop oilfield properties for supply and will install special equipment for decarbonizing and processing at that point, prior to run to refinery through pipe lines, latter to be built for distance of about 60 miles. Oilfield developments will cost close to $1,500,000.

American Steel & Wire Co., 208 South LaSalle Street, Chicago, has leased about 25,000 sq. ft. in buildings of Corpus Christi Warehouse Co., Corpus Christi, Tex., for storage and distributing plant.

United States Engineer Office, Mobile, Ala., will receive bids until Oct. 19 for two cast steel propeller wheels and five cast steel cutter blades.

Gouner Sugar Machinery Co., 937 Gravier Street, New Orleans, is planning contract with outside iron and steel shops for fabrication of parts for sugar machinery, including production of stainless steel or iron parts coming into contact with liquids.

Board of Education, Longview, Tex., plans installation of manual training equipment in new three-story and basement senior high school, for which an appropriation of $175,000 has been authorized. Mark Lemmon, Dallas, Tex., is architect.

Continental Can Co., Jacksonville, Fla., has awarded general contract to Ralph E. Spaulding, 1252 Windsor Place, for one-story addition, 48 x 75 ft., for storage and distribution.

Gifford-Hill Co., Inc., Dallas, Tex., operating sand and gravel properties, has purchased plant and property of Bronzos Valley Gravel Co., near Calvert, Tex., and will operate as unit. Plans are under way for installation of new mining plant, with digging, elevating, conveying, loading and other equipment.

City Council, Palestine, Tex., is planning lease of about 275 acres for establishment of municipal airport and will build hangar with repair and reconditioning facilities, and other field units. A bond issue has been approved for project.

Houston Compress Co., Houston, Tex., has awarded general contract to Donald Hall, Union National Bank Building, for one-story addition, to cost about $65,000 with compress machinery and other equipment. R. J. Cummins, Bankers Mortgage Building, is engineer.

H. C. Badger, Amarillo, Tex., care of Harry M. Warren, 1012 Pierce Street, architect, has plans for new one-story ice-manufacturing plant, 45 x 70 ft., to cost about $50,000 with machinery.

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Pacific Coast

PLANS are under way by Los Angeles Gas & Electric Corpn., 810 South Flower Street, Los Angeles, for extensions and improvements in steam-operated electric generating plant at Seal Beach, including new buildings and installation of 50,000-hp. turbo-generator unit and accessories. Company will also make extensions in transmission lines and main power switching station. Entire project will cost about $3,500,000.

Pittsburgh Plate Glass Co., Grant Building, Pittsburgh, Pa., has plans for initial units for new sheet glass-manufacturing plant on about 80 acres at Santa Ana, Cal., recently acquired. Project will include power house, machine shop and other units, to cost over $3,000,000 with machinery. Stone & Webster Engineering Co., 49 Federal Street, Boston, Mass., and 601 West Fifth Street, Los Angeles, is engineer.

Turlock Irrigation District, Turlock, Cal., has plans for a power dam, to be known as Groveland dam, and hydro-electric generating plant, with transmission system, to cost over $1,000,000. Roy V. Meikle is chief engineer.

Imperial Valley Citrus Exchange, Brawley, Cal., plans installation of conveying, packing and other equipment in new one-story fruit-packing plant, 90 x 125 ft., to cost about $30,000.

Board of Education, Vallejo, Cal., contemplates a one-story vocational training shop in connection with new junior high school group, to cost $230,000, in which amount bonds have been authorized. Davis-Pearce Co., Grant and Weber Streets, Stockton, Cal., is architect.

Northwest Public Service Co., Electric Building, Portland, has awarded general contract to Drake, Wyman & Voss, United States Bank Building, for extensions and improvements in car barns, with repair facilities, to cost about $35,000. Harry Herzog, Mead Building, is architect.

United States Engineer's Office, Portland, is asking bids until Oct. 26 for indicating and recording meters.

Highland Orange Association, Highland, Cal., plans installation of packing, conveying and other mechanical equipment in new one-story fruit packing plant, 90 x 130 ft., to cost about $55,000.

Patterson-Pacific Parchment Co., San Francisco, care of F. H. Slocombe, 3830 Harrison Street, Berkeley, Cal., architect, has awarded general contract to Harry C. Knight, 327 Seventeenth Street, Oakland, Cal., for three-story storage and distributing plant, to cost about $35,000 with equipment.

Tieton Cold Storage Co., Tieton, Wash., has approved plans for a one-story cold-storage and refrigerating plant, 72 x 180 ft., to replace a plant recently destroyed by fire, to cost about $70,000 with machinery.

Canada

DEPARTMENT of National Defence, Parliament Buildings, Ottawa, Ont., will establish an air base at Trenton, Ont., including hangars, repair shops, etc., to cost $3,500,000.

DeForest-Crosley Radio Co., Ltd., 245 Carlaw Avenue, Toronto, contemplates starting work next spring on erection of a plant at Leaside, Ont.

Lake Shore Mines, Ltd., Kirkland Lake, Ont., will start construction soon on a new unit to its mill, to increase capacity from 2500 tons to 4000 tons a day.

Granada Gold Mines, Ltd., Rouyn, Que., will install new equipment at mine and plans to enlarge mill.

Canusa Mining & Exploration Co., Metropolitan Building, Toronto, contemplates large expenditure on equipment for mine in Porcupine district, to include installation of a new ball mill, etc.

Philip Bates, Ridgetown, Ont., has awarded contract to Warwick & Son for erection of a plant for manufacture of automobile accessories.

Canada Ingot Iron Co., Ltd., Guelph, Ont., will establish a plant at 8302 103rd Street South, Edmonton, Alta., for manufacture of iron culverts for Western markets.

Sterling Oil & Refinery Co., Moose Jaw, Sask., will erect an oil refinery and other buildings to cost $200,000.

City Council, Winnipeg, Man., contemplates erection of a plant to cost $30,000 for manufacture of sewer pipe. M. Peterson, City Hall, is clerk.

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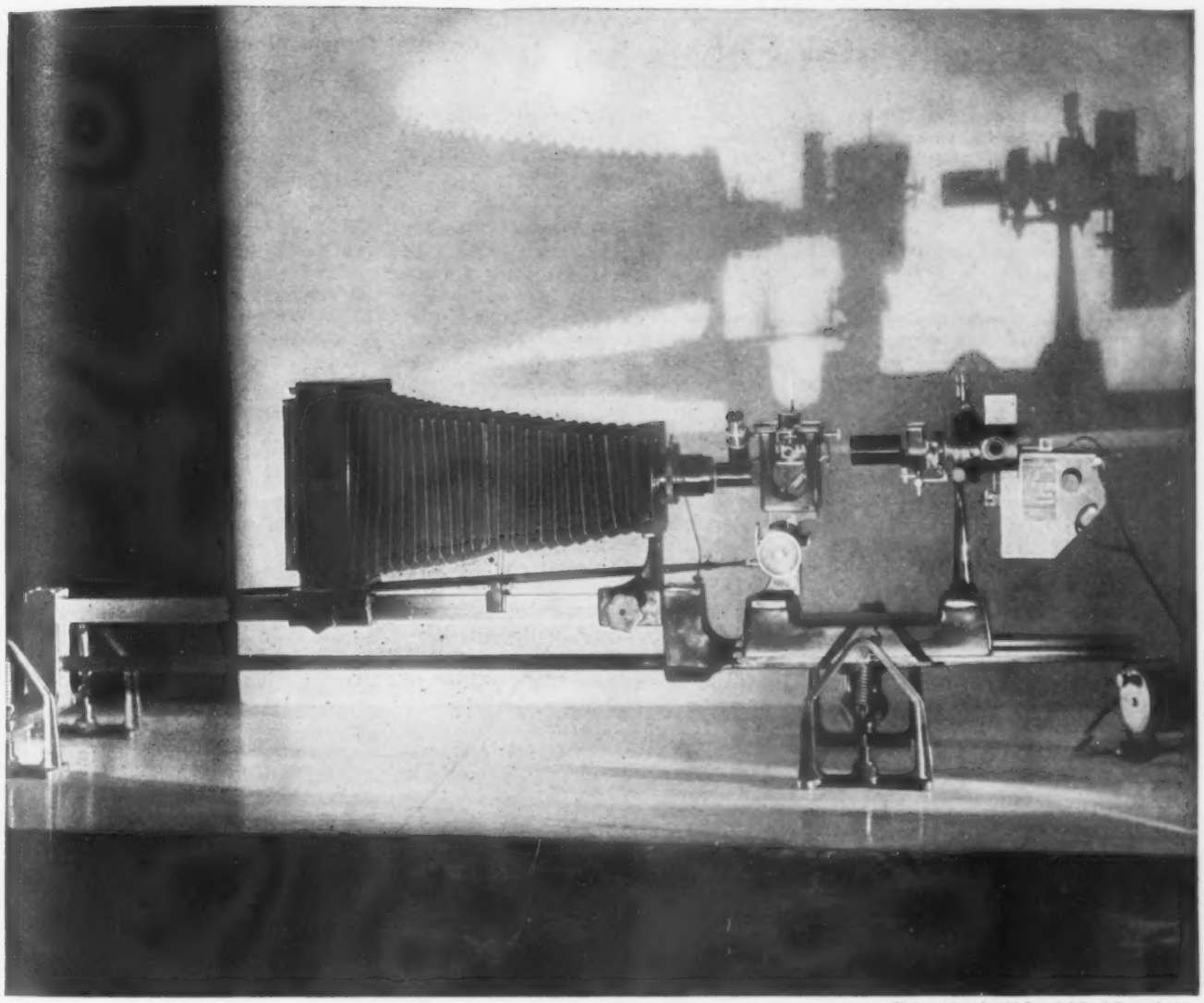
Foreign

PLANS have been approved by Soviet Russian Government, Moscow, for electrification of several railroad lines, including Lunevsk branch, about 113 kilometers long; line in Leningrad-Oraninenbaum district, with branch to Gatchina, and branch line from Mineralnye Vody, in Caucasus district, to Kislovodsk. Two last noted lines will total about 145 kilometers. Project will include construction of electric locomotives at Kolumna plant in Moscow district. Program will cost over $5,000,000.

A company is being organized at Caracas, Venezuela, with capital of $50,000, to erect a knitting mill, according to information received by Bureau of Foreign and Domestic Commerce, Department of Commerce, Washington, from H. C. von Struve, American consul at Caracas.

National Administrative Council of Uruguay, Montevideo, has approved a bill for group of bulk oil storage and distributing plants, including pumping stations, power houses, etc., for Government gasoline and kerosene supplies. A fund of $1,000,000 has been authorized to carry out project, which will be under direction of State Department of Public Works.

Compagnie Francaise des Petroles, Ltd., Paris, France, has authorized an increase in capital from 205,000,000 to 315,000,000 fr. (from $7,995,000 to $12,285,000), considerable part of fund to be used for expansion, particularly in connection with developments, pipe lines, storage and distributing plants in Iraq oilfields, to be carried out by Iraq Petroleum Co., in which a substantial interest is held. A new refining interest has been formed



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▲▲ Business as Others See It

Digest of Current Financial and Economic Opinion ▲▲

GENERAL approval has met Mr. Hoover's latest scheme to smooth out some of our current difficulties. One heavy dissent, however, comes from *Financial Chronicle*, which says:

"We cannot see how this plan is to work wonders any more than the numerous similar schemes proposed in the past. The scheme proceeds on the theory that there is a shortage of credit; we cannot discover any indications of anything of the kind. It also proceeds on the theory that the banks are suffering from a shortage of funds . . ., whereas their vaults are bursting with funds. . . .

"We must get back to the state where thrift and saving will again be accepted as the standard of living. . . . We think that artificial contrivances should be eschewed and the depression allowed to work its own cure."

More optimistic are most of the other commentators. *Annalist* qualifies its indorsement by the remark that it will not help "the European dislocations, which are, also, a source of danger to us." But the "bank pool plan has done much to steady public sentiment, and the application of it . . . will have important remedial effects on the domestic situation."

C. F. Hughes, writing in New York *Times*, notes that "renewed confidence has become apparent in business quarters since the announcement of the Hoover plan to meet financial and banking distress. . . . Accompanying this improved sentiment was a fair rise in the weekly business index, for the first time since July. . . . A measure of inflation now seems to be commonly accepted as the probable outcome of steps being taken, both here and abroad, toward relieving the depression."

Encouragement is expressed by La Salle Extension University in "the fact that many unsound situations, both domestic and foreign, are being brought into the open and tackled with vigor. Business men and financial and political leaders are more determined than at any time since the slump began to face the facts, no matter how disagreeable they may be. . . .

"Weak elements in the business and economic situation are steadily being eliminated, leaving only the strongest and the best situated to carry on necessary operations. . . . Often recovery is more rapid after a severe depression than after a minor one. The readjustments made are more fundamental, and put the entire economic system on a sounder basis than it was before."

Harvard Economic Society welcomes the rise in the New York rediscount rate as a constructive move. "Such an abnormally low rate could not continue indefinitely after a substantial gold outflow got under way. The new rate is still low, and will hardly do more than remove the premium which the old rate placed upon gold exports. If the outflow continues, and it is desired to check it, further increases will be necessary."

That rate action is called by *Financial Chronicle* "the really constructive event of the week."

Meantime, Harvard warns that "there is no justification for the opinion, apparently widely held, that the balancing of the British budget and the freeing of sterling exchange from gold mark the end of the depression, and that rapid world recovery will follow."

Bainbridge Colby has made a strong statement to the effect that European war debts cannot, with any justice, be saddled upon the American taxpayer. No further cuts in foreign debts owed to the United States Government can be tolerated, he says.

"What the world needs is a stable standard of value, accepted at par by all the great nations," writes Theodore H. Price, in *Commerce and Finance*. "Many of the world's most prominent financiers and economists are in favor of an international token acceptable as a standard of value everywhere, supported by the credit of all nations able to supply security for their shares of the currency issued."

This writer suggests the "doubt whether the unemployed are as numerous as had been supposed. If experience shall show that a larger number of those who are willing to work can get jobs at fair prices, the result may be an autumn and winter of increasing activity, which will bring about a wonderful change in the commercial and industrial outlook."

Col. Leonard P. Ayres points to the flood of bad news, which "we are getting behind us now with extraordinary rapidity," as a good sign. "Repeatedly in the past the final declines of long depressions have been marked by just such cumulative groupings of unfavorable developments. In very many important respects the outlook seems more hopeful now than it did ten years ago this month.

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under name of Compagnie Francaise de Raffinage, Ltd., to develop and operate oil refineries.

Kelsey-Hayes Wheel Co., Ltd. of England, London, a subsidiary of Kelsey-Hayes Wheel Corpn., Detroit, manufacturer of wire wheels for automobiles, hubs, accessories, etc., has completed first unit of new plant at Dagenham, England, and will develop capacity for England and continental distribution. Additional units will be established.

United Oil Industry (Soyuzneft), Soviet Russia Government, Moscow, is planning new oil refining plants at Khabarovsk and Vladivostok, with divisions for gasoline manufacture under cracking process. It is also planned to enlarge oil refinery new in course of erection in Kokand (Uzbekistan), which will secure crude oil from Central Asiatic field. Oil plants will be built at Moscow, Samara and Stalingrad, with departments for production of lubricants, asphalt and kindred oil products. Additional plants are scheduled to be built in 1933 and 1934, until total refining capacity of 25,000,000 tons is developed. Amtorg Trading Corpn., 261 Fifth Avenue, New York, is official buying agency.

New Trade Publications

Apron Feeders.—Link-Belt Co., Chicago, Ill. Illustrated leaflet describes heavy-duty, manganese-steel apron feeders, with information respecting selection of feeder sizes.

Industrial Instruments. — Bacharach Industrial Instrument Co., 7000 Bennett Street, Pittsburgh. Leaflet describes the features and advantages of the Maihak indicator for gas compressors.

Potentiometer Pyrometer. — Brown Instrument Co., Philadelphia. Twelve-page folder, showing in tabloid form principal features of a new potentiometer pyrometer.

Protective Coatings.—Wailes Dove-Hermiston Corpn., New York.—"Special Protective Coatings for Industry," is the title of a new booklet, Bulletin No. 505, issued by this corporation, manufacturers of anti-corrosive coatings and specialists in the protection of underground and underwater surfaces and other structures subject to extreme corrosive influences. For the first time, the company has issued under one cover all essential data for the guidance of engineers and others concerned with the prevention of corrosion in various industrial fields. The booklet is illustrated by many photographs.

Valves.—Merco Nordstrom Valve Co., 343 Sansome Street, San Francisco. Various types of Nordstrom lubricated-plug cock valves are illustrated in a new 172-page catalog. Valves made of bronze, aluminum and "Mercalloy" are included, as well as valves with steam jackets, remote control and multiple ports, both high and low pressure.

Portable Electric Tools. — United States Electrical Tool Co., Cincinnati. Complete line of drills, buffers, grinders, portable saws, as well as flexible shaft machines, tools and attachments including rotary files, are listed in a new catalog. Prices appearing in this publication show a number of reductions.

Collapsing Taps. — Geometric Tool Co., New Haven. Stationary and rotary types are illustrated in eight-page booklet. Plate, sleeve and hand or lever tripping taps are included; also special models, such as lengthened taps and taps with reamers, pilots and combinations.